



SPECTRA T50e

ASSISTED SELF-MAINTENANCE (ASM) GUIDE



PN 90970023 Revision A

Notices

Except as expressly stated herein, Spectra Logic Corporation makes available this Spectra® library and associated documentation on an “AS IS” BASIS, WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, BOTH OF WHICH ARE EXPRESSLY DISCLAIMED. In no event shall Spectra Logic be liable for any loss of profits, loss of business, loss of use or data, interruption of business, or for indirect, special, incidental or consequential damages of any kind, even if Spectra Logic has been advised of the possibility of such damages arising from any defect or error.

Information furnished in this manual is believed to be accurate and reliable. However, no responsibility is assumed by Spectra Logic for its use. Due to continuing research and development, Spectra Logic may revise this publication from time to time without notice, and reserves the right to change any product specification at any time without notice.

If you do not agree to the above, do not use the Spectra library; instead, promptly contact Spectra Logic for instructions on how to return the library for a refund.

BlueScale, Spectra, SpectraGuard, TeraPack, and the Spectra Logic logo are registered trademarks of Spectra Logic Corporation. All rights reserved worldwide. All other trademarks and registered trademarks are the property of their respective owners.

Spectra T50e Library – Assisted Self-Maintenance Guide
P.N. 90970023 Revision A, August 2008

Copyright © 2008 Spectra Logic Corporation. All rights reserved.

License

You have acquired a Spectra library that includes software owned or licensed by Spectra Logic from one or more software licensors (“Software Suppliers”). Such software products, as well as associated media, printed materials and “online” or electronic documentation (“SOFTWARE”) are protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties.





If you do not agree to this end user license agreement (EULA), do not use the Spectra library; instead, promptly contact Spectra Logic for instructions on return of the Spectra library for a refund. Any use of the Software, including but not limited to use on the Spectra library, will constitute your agreement to this EULA (or ratification of any previous consent).

Grant of License. The Software is licensed on a non-exclusive basis, not sold. This EULA grants you the following rights to the Software:




- You may use the Software only on the Spectra library.
- **Not Fault Tolerant.** The Software is not fault tolerant. Spectra Logic has independently determined how to use the Software in the Spectra library, and suppliers have relied upon Spectra Logic to conduct sufficient testing to determine that the Software is suitable for such use.
- **No Warranties for the SOFTWARE.** The Software is provided “AS IS” and with all faults. The entire risk as to satisfactory quality, performance, accuracy, and effort (including lack of negligence) is with you. Also, there is no warranty against interference with your enjoyment of the Software or against infringement. If you have received any warranties regarding the SOFTWARE, those warranties do not originate from, and are not binding on Software suppliers.
- **Note on Java Support.** The Software may contain support for programs written in Java. Java technology is not fault tolerant and is not designed, manufactured, or intended for use of resale as online control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communications systems, air traffic control, direct life support machines, or weapons systems, in which the failure of Java technology could lead directly to death, personal injury, or severe physical or environmental damage.
- **No Liability for Certain Damages.** Except as prohibited by law, Software suppliers shall have no liability for any indirect, special, consequential or incidental damages arising from or in connection with the use or performance of the Software. This limitation shall apply even if any remedy fails of its essential purpose. In no event shall Software suppliers, individually, be liable for any amount in excess of U.S. two hundred fifty dollars (U.S. \$250.00).
- **Limitations on Reverse Engineering, Decompilation, and Disassembly.** You may not reverse engineer, decompile, or disassemble the Software, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.
- **Software Transfer Allowed with Restrictions.** You may permanently transfer rights under this EULA only as part of a permanent sale or transfer of the Spectra library, and only if the recipient agrees to this EULA. If the Software is an upgrade, any transfer must also include all prior versions of the Software.
- **Export Restrictions.** Export of the Software from the United States is regulated by the Export Administration Regulations (EAR, 15 CFR 730-744) of the U.S. Commerce Department, Bureau of Export Administration. You agree to comply with the EAR in the export or re-export of the Software: (i) to any country to which the U.S. has embargoed or restricted the export of goods or services, which as May 1999 include, but are not necessarily limited to Cuba, Iran, Iraq, Libya, North Korea, Sudan, Syria, and the Federal Republic of Yugoslavia (including Serbia, but not Montenegro), or to any national or any such country, wherever located, who intends to transit or transport the Software back to such country; (ii) to any person or entity who you know or have reason to know will utilize the Software or portion thereof in the design, development or production of nuclear, chemical, or biological weapons; or (iii) to any person or entity who has been prohibited from participating in U.S. export transactions by any federal agency of the U.S. government. You warrant and represent that neither the BXA nor any other U.S. federal agency has suspended, revoked or denied your export privileges. For additional information see www.microsoft.com/exporting/.

Cautions and Warnings



General

-
- Caution:**  Do not attempt to save the library configuration if the LCM is malfunctioning. Any information saved at this point may be corrupted.
-
- Caution:**  Do not install the flash card from the LCM you replaced unless directed to do so by SpectraGuard Technical Support. Installing a corrupted flash card can cause the new LCM to fail.
-
- Caution:**  Improperly adding or removing a device from a SCSI bus can cause the host computer to crash. If you leave the host running during this procedure, Spectra Logic assumes no responsibility for damage to data or equipment.
-
- Caution:**  If you are replacing a tape drive, the new tape drive must be the same type as the one you replace. Compare the part number on the box and on the tape drive to verify that the tape drive is the same type.
- LTO-4 Full-height Fibre Channel tape drive: P.N. 90979468
 - LTO-4 Half-height SCSI tape drive: P.N. 90979469
 - LTO-3 Full-height SCSI tape drive: P.N. 90979470
-

Cartridge Use

-
- Caution:**  Use only certified cleaning cartridges to clean your tape drives. Carefully follow all instructions and recommendations provided with the cleaning cartridge. Do not rewind and reuse the material in a cleaning cartridge. Reusing the material may redistribute contaminants previously removed from the tape path. If all of the cleaning material has been used, discard the cartridge and use a new cleaning cartridge.
-
- Caution:**  Use only the media approved by Spectra Logic for use in the tape drives installed in your library. Improper media will result in damage to the tape drives, library, and the media.
-
- Caution:**  Make sure that the cleaning cartridge has a bar code label. Your software must be able to identify the cleaning cartridge and use it only for cleaning tape drives. Any attempts to use a cleaning cartridge for data storage causes software failures.
-

Electrical Shock

-
- Warning:**  Risk of electrical shock. Hazardous moving parts. Turn off the power to the library and disconnect the power cords before accessing the transporter.
-
- Warnung:**  Gefahr eines elektrischen Schlags. Gefährliche bewegliche Teile. Schalten Sie das Gerät aus, um die Library und trennen Sie das Netzkabel vor dem Zugriff auf die Transporter.
-

Power



Disconnect the power cord to discontinue power to the library.



Bitte entfernen Sie bei Wartungsarbeiten an der Library das Netzkabel.



Use only manufacturer-supplied power cords.



Bitte verwenden Sie ausschliesslich das vom Hersteller mitgelieferte Netzkabel.



Do not use damaged power cords.



Verwenden Sie keine beschädigten Netzkabel.



Disconnect the power cord prior to removing the top cover.



Entfernen Sie das Netzkabel vor dem Öffnen des Gehäuses.

Contacting Spectra Logic

To obtain general information

Spectra Logic Web Site: www.spectrallogic.com

United States Headquarters

Spectra Logic Corporation
1700 North 55th Street
Boulder, CO 80301
USA

Phone: (800) 833-1132 or (303) 449-6400

International: 00 (1) 303 449 6400

Fax: (303) 939-8844

European Office

Spectra Logic Europe Ltd.
Magdalen Centre
Robert Robinson Avenue
Oxford Science Park
OXFORD
OX4 4GA
United Kingdom

Phone: 44 (0) 870 112 2150

Fax: 44 (0) 870 112 2175

SpectraGuard Technical Support

Web Site: www.spectrallogic.com/support

Knowledge Base: www.spectrallogic.com/knowledgebase

Email: support@spectrallogic.com

Phone Numbers:

United States and Canada: (800) 227-4637

International: 00 (1) 303 449 0160

Contents

About This Guide 9

About ASM	9
Intended Audience	10
Related Publications	10
Spectra T50e Library	10
LTO Ultrium Tape Drives	11
Conventions Used in this Guide	11

Chapter 1 – Preparing for Maintenance 13

Replaceable Interior Components	13
Replaceable Rear Panel Components	14
Maintenance Preparation	15
Ensuring ESD Protection	15
Gathering Tools and Supplies	15
Turning the Power On and Off	15
Resetting the Library	17

Chapter 2 – Replacing the LCM or Flash (SD) Card 19

Before You Begin	19
Gathering Tools and Supplies	20
Continuing Backups	20
Preparing for Replacement	20
Replacing the LCM	30
Removing the LCM	30
Installing the LCM	31

Replacing the Flash (SD) Card	32
Removing the Flash Card	32
Installing the Flash Card	33
Restoring the Library Configuration	34
Restoring the Configuration via USB	35
Restoring the Configuration via the RLC	35
Restoring the Configuration via Gathered Information	36
Restarting Backups	37
Storing Configuration Changes	37

Chapter 3 – Replacing a Power Supply Module **39**

Gathering Tools and Supplies	39
Continuing Backups	39
Replacing the Power Supply	40
Installing a Redundant Power Supply	41
Restarting Backups	42

Chapter 4 – Replacing or Cleaning a Tape Drive **43**

Before You Begin	43
Preparing for Installation or Replacement	44
Gathering Tools and Supplies	44
Following Backup Guidelines	45
Following the Host Power-off Recommendation	45
Powering the Library On	46
Installing an Additional Tape Drive	46
Replacing an Existing Tape Drive	50
Testing the Tape Drive	53
Restarting Backups	54
Removing an Existing Tape Drive	54
Restarting Backups	57
Returning Components	57

Cleaning a Tape Drive Manually	57
Determining Whether Cleaning is Required	57
Gathering Tools and Supplies	58
Continuing Backups	58
Cleaning a Tape Drive Manually	58
Tracking Cleaning Cartridge Use	59
Purchasing Cleaning Cartridges	59

Chapter 5 – Replacing the Transporter **61**

Before You Begin	61
Gathering Tools and Supplies	61
Continuing Backups	62
Powering off the Library	62
Removing the Magazines	63
Accessing the Transporter	64
Removing the Transporter	64
Installing the Transporter	68
Completing the Replacement	74

Chapter 6 – Returning Components **77**

Packaging a Component for Shipment	77
Shipping RMA Returns	79

Index **81**

Notes

About This Guide

This guide is used in conjunction with an Assisted Self-Maintenance (ASM) support contract for the Spectra® T50e library. It provides detailed instructions for replacing the following library components:

- Flash Card
- Library Control Module (LCM)
- Power Supply Module
- Tape Drive
- Transporter

Note: Depending on the level of ASM support you purchased, some of the components listed above and described in this guide may not be stocked at your site.

To make sure that you have the latest version of this guide, visit the Spectra Logic web site at www.spectralogic.com/documents.

About ASM

Assisted Self-Maintenance (ASM) is a technical support option that lets you maintain a stock of replacement components (known as Customer Replaceable Units or CRUs) for your library at your site. Having parts on site lets you make immediate repairs to your library with telephone assistance from SpectraGuard® Support.

Your ASM service contract provides access to SpectraGuard Support staff from 8am to 5pm your local time. Optionally, you can purchase 24-hour-a-day telephone access to SpectraGuard Support as part of your ASM service contract. See *Contacting Spectra Logic* on page 4 for contact information.

You should work closely with SpectraGuard Support *before and during* the replacement of any library component. The following steps summarize the ASM process:

1. When you experience a problem, open a support ticket either by:
 - using your library's AutoSupport feature
 - or-
 - calling SpectraGuard Support (see *Contacting Spectra Logic* on page 4)
2. Working with Support, determine the source of the problem and identify a solution.

3. If Support recommends replacing a component, follow the instructions in this guide to replace the malfunctioning component with a new one from your stock.
4. Return the malfunctioning component to Spectra Logic for inspection (see *Chapter 6 – Returning Components* on page 77).
5. When Spectra Logic receives the malfunctioning component, they ship a new replacement component to you for future use.

Intended Audience

This guide is intended for data center personnel who perform on-site maintenance of data storage equipment. The information in this guide assumes a familiarity operating the library, as described in the *Spectra T50e Library User Guide*. It also assumes a familiarity with SCSI and Fibre Channel communication protocols as well as with network connectivity protocols, such as Fibre Channel, Ethernet, and iSCSI. It also assumes a knowledge of technical tasks, such as configuring operating systems and installing drivers.

Related Publications

For additional information about the T50e library and the tape drives installed in it, refer to the following publications.

Spectra T50e Library

This guide and the following documents related to the T50e library are available as PDF files on the Spectra Logic web site at www.spectralogic.com/documents.

- The *Spectra T50e Library User Guide* describes how to use, configure, maintain, and troubleshoot the Spectra T50e library. It also provides instructions for using BlueScale Encryption Basic Edition and the specifications for the library.
- The *Spectra T50e Library Release Notes* provide the most up-to-date information about the Spectra T50e library, drives, and media.
- The *BlueScale Encryption User Guide* provides detailed information about using BlueScale Encryption. It also provides useful information about encryption best practices and recycling encryption media.
- The *Spectra T-Series Library Developer Guide* provides detailed information about the SCSI and Fibre Channel commands used in the library.


LTO Ultrium Tape Drives


Check the IBM web site at www.storage.ibm.com/tape/lto/oem/index.html to locate documentation for LTO Ultrium tape drives.

Conventions Used in this Guide

This manual uses the following conventions to highlight important information:

Note: Provides additional information or suggestions about the current topic.

Caution:  Provides information you must know to avoid damage to the library or tape drives or to avoid losing data.

Warning:  Provides information you must know to avoid personal injury.

Notes

1 Preparing for Maintenance

This chapter shows the location of the components covered in this guide. It also provides information on the following topics:

- *Maintenance Preparation* on page 15
- *Turning the Power On and Off* on page 15
- *Resetting the Library* on page 17

Replaceable Interior Components

The transporter is the only interior component covered by this guide. Figure 1-1 shows the location of the transporter. To replace the transporter, see *Chapter 5 – Replacing the Transporter*.

Depending on the ASM service contract you purchased, the transporter may not be included with the components stored at your site.

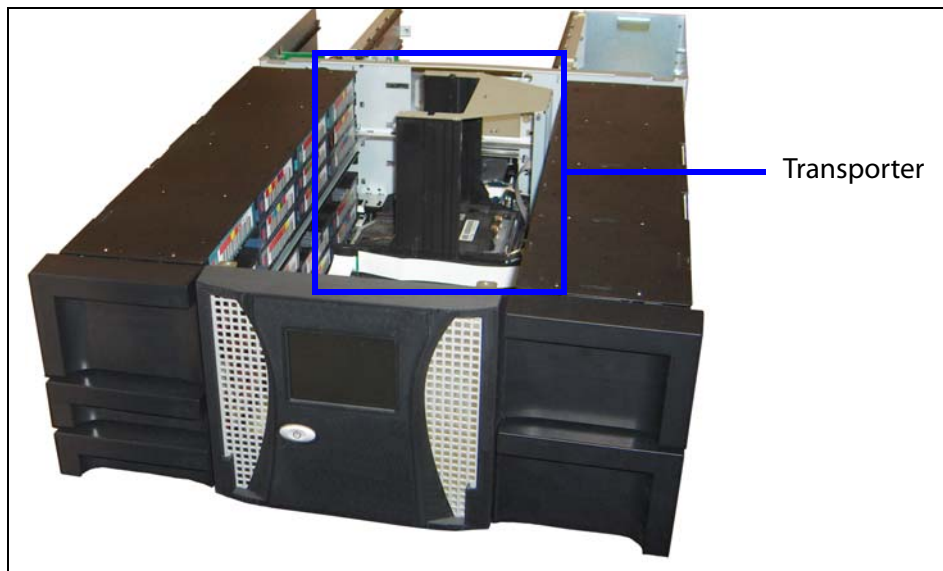


Figure 1-1 Location of the transporter (cover off for clarity only).

Replaceable Rear Panel Components

The following table lists the rear panel components covered in this guide. Figure 1-2 shows the component locations.

		Beginning on...
Flash (SD) card	<i>Chapter 2 – Replacing the Flash (SD) Card</i>	page 21
Library Control Module (LCM) ^a	<i>Chapter 2 – Replacing the LCM or Flash (SD) Card</i>	page 19
Power supply module	<i>Chapter 3 – Replacing a Power Supply Module</i>	page 39
Tape drive (mounted on a sled)	<i>Chapter 4 – Replacing or Cleaning a Tape Drive</i>	page 43

a. Depending on your service contract, this may not be included with the components stored at your site.

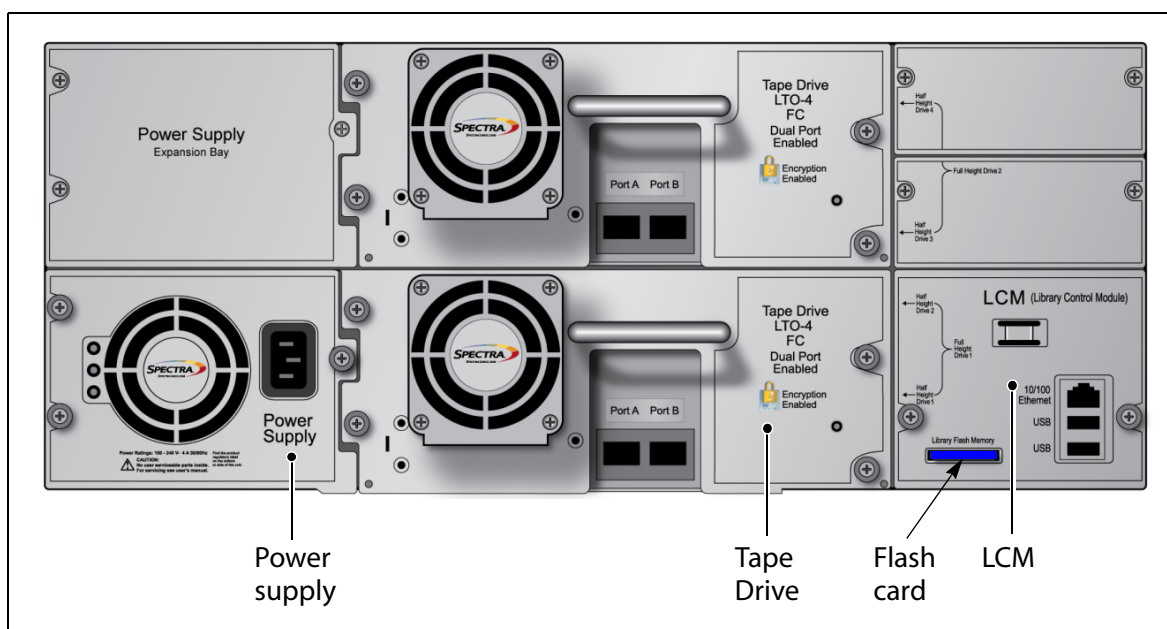


Figure 1-2 Rear panel of library.

During normal operation, any bays that do not contain components have covers installed to maintain proper air circulation through the library.

Maintenance Preparation

This section provides important information about electrostatic discharge (ESD) prevention. It also lists the tools required for all maintenance procedures and provides power cycling information.

Ensuring ESD Protection

The repair environment for the library must be free of conditions that could cause electrostatic discharge (ESD). To protect the library from ESD, follow these procedures when repairing or testing the library:

- Place a static protection mat on the work surface used while removing and installing library components. Use a 1-megaohm resistor to ground the static protection mat.
- Wear a static protection wrist band whenever you handle library components that have been removed from their antistatic bags. Connect this wrist band to the static protection mat or to other suitable ESD grounding.
- Keep all components in antistatic bags when not in use.
- Ensure that the host computer communicating with the library is properly grounded.
- Make sure the AC power source is properly grounded when the library is in operation.

Gathering Tools and Supplies

The following tools are required to perform the maintenance procedures described in this guide:

- #1 Phillips screwdriver
- #2 Phillips screwdriver
- A paper clip or similar object
- USB storage device (included with library)

Turning the Power On and Off

Some of the procedures in this document require you to power the library off and on; when you need to power cycle the library, follow these instructions.

Power On the Library

Before you power on the library, make sure that the provided power cord is plugged into the AC outlet on the back of the library. The main AC connections provide power to the power supply module, which is controlled from the front panel power button.

Note: If the library has an N+1 redundant power supply, make sure that one of the provided power cords is plugged into the AC outlet on the back of the library.

Press and hold the front panel power button (Figure 1-3) for two to three seconds until the button's LED illuminates. Wait while the library completes its power-on sequence, which typically takes between six to nine minutes, depending on the library configuration. During the power-on sequence the library initializes all of its installed components. The library is ready to begin operation when the login screen displays on the front panel.

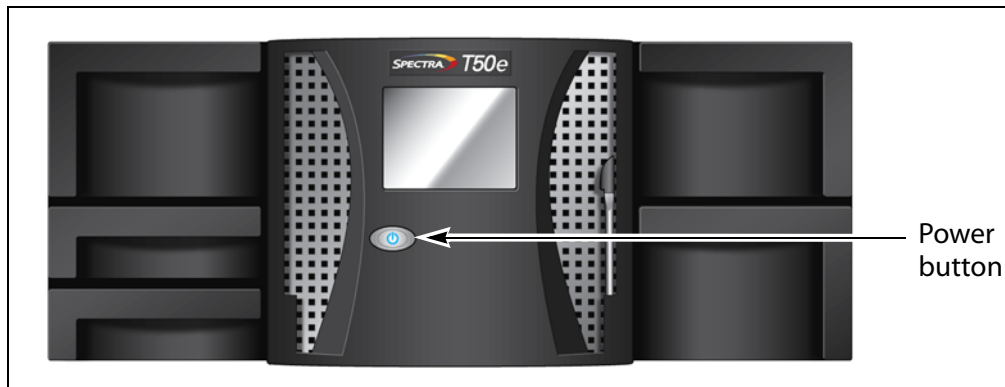


Figure 1-3 Power the library on.

Power Off the Library

Press and hold the front panel power button for approximately one second. The power-off sequence takes approximately two minutes while the library allows applications to shut down gracefully.

Note: If the system is stable when you press the power button, a message displays indicating that the power button was pressed.

If the system is unstable when you press the power button—if you power off the library when it is in an error state—the power off time takes approximately one minute and will show no indication that it is powering off. Wait for the sequence to complete.

Resetting the Library

Some types of replacement procedures require you to reset the library before the changes take affect.

Note: Do not reset the library unless SpectraGuard Technical Support specifically instructs you to do so. Trace data generated by the library may be lost when you reset the library or a component, making diagnosing problems difficult.

Follow these steps to reset the library.

1. Power off the library (see *Power Off the Library* on page 16).
2. Wait at least 10 seconds after the library has completed its power down sequence, which typically takes approximately two minutes.
3. Power on the library (see *Power On the Library* on page 16). When the library completes its power-on sequence, it is ready to resume operation.

Notes

2 Replacing the LCM or Flash (SD) Card

This chapter describes how to replace the T50e Library Control Module (LCM) or the Flash (SD) card (flash card).

The library contains a single LCM, which provides the logic and circuitry to control the robotics and display the user interface on the library's touch screen. The LCM includes an embedded web server to provide remote access to the user interface through the Remote Library Controller (RLC) using a standard web browser. It also houses the flash card. Figure 2-1 shows the available connections on the LCM.

Note: Depending on the ASM service level you purchased, the LCM may not be included in your on-site ASM kit.

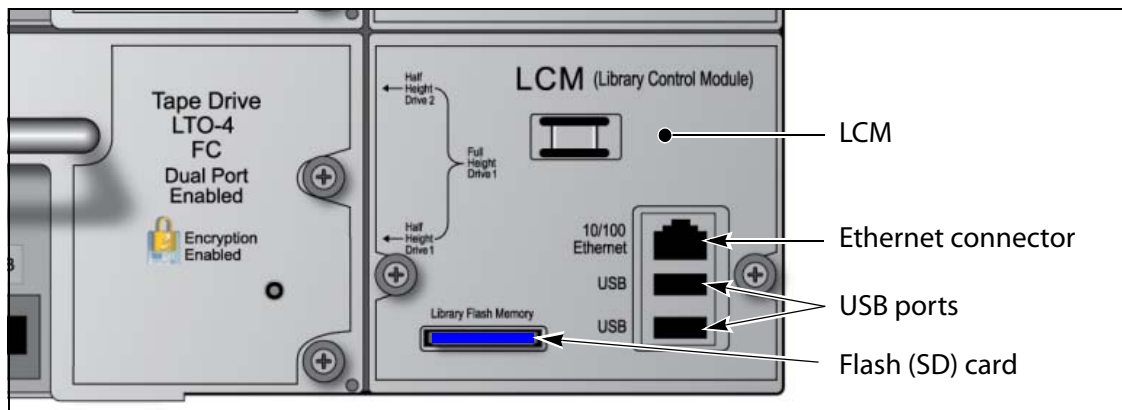


Figure 2-1 Connections to the LCM.

Before You Begin

- **Ensure that the work area is free from conditions that could cause electrostatic discharge (ESD)**—discharge static electricity from your body by touching a known grounded surface, such as a computer's metal chassis.
- **Ensure that the library is not accessing the flash card**—It is important that you do not interrupt the card during write or erase activity.

- **Ensure that you have saved a backup copy of your library's configuration**—see *Preparing for Replacement* on page 20).
- **Power the library off**—Ensure that the library and flash card are both idle, and then power the library off (*Resetting the Library* on page 17 for important information).

Gathering Tools and Supplies

- A new LCM module from Spectra Logic Corporation (replacing the LCM)
- A new Flash (SD) card from Spectra Logic Corporation (replacing the flash card)
- A #2 Phillips screwdriver

Continuing Backups


If the LCM or flash card are malfunctioning, you have no control of the library through the Library Controller (LC) on the front panel or through the Remote Library Controller (RLC). A malfunctioning LCM or flash card can also affect robotics and tape drives. Backups are interrupted if the robotics or tape drives are affected and cannot be restarted until after the LCM or flash card is replaced.

Preparing for Replacement

You have a Valid Backup Library Configuration Whenever you modify the configuration of the library or a partition, you have the option of saving the configuration to a USB storage device, as described in the *Spectra T50eLibrary User Guide*. The saved configuration can be used to restore a lost configuration.

If you previously saved the library configuration on a USB storage device or uploaded it to a file on your computer, locate the most current configuration file before beginning the replacement procedure. You can use this saved configuration to restore the library configuration after you replace the LCM.

If you have a valid saved configuration, continue with *Replacing the LCM* on page 30 or *Replacing the Flash (SD) Card* on page 32.

Caution:  Do not attempt to save the library configuration if either the LCM or Flash (SD) card is malfunctioning. Any information saved at this point may be corrupted.

You do *not* have a Valid Backup Library Configuration *If do not have a valid backup library configuration*, or are unable to locate it, you may need to reconfigure your library manually after replacing the LCM or flash card.

In this case, it is important to write down the following library information before continuing. The items to write down are listed here and described below:

- Option keys
- Encryption keys
- Partition information
- Network information
- Email Users and SMTP IP Address
- AutoSupport Log Profile information for each profile
- General settings
- Library Logon Users and Passwords
- Auto Support Log file

Option Keys

1. Select **Configuration** → **Option Keys**. The Option Keys screen appears.

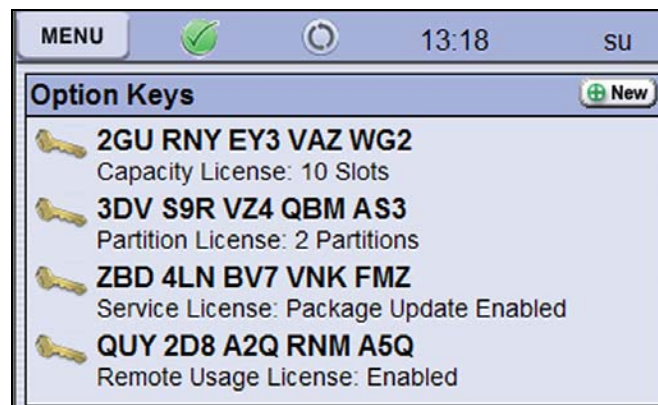


Figure 2-2 Configuration menu–Option Keys screen.

2. Write down all of the 15-character alphanumeric keys.

Encryption Keys

This information is only needed if you have enabled encryption in a partition in the library.

1. Select **Security** → **Encryption**. The Encryption configuration screen appears.



Figure 2-3 Security menu–Encryption Configuration screen.

2. Follow these steps for each encryption key.
 - a. Select **Export**.



Figure 2-4 Security menu–Encryption Export Type screen.

- b. Decide whether to save the key to a USB device, or to mail it to a previously defined email recipient.

Spectra Logic recommends saving the key to a USB device as it allows the library to verify that the save completed successfully by using the **Check Key Files** option. If you plan to save the key to a USB device, plug the USB device into the LCM before proceeding (see Figure 2-1).

Note: Do not use the default autosupport@spectrallogic.com email recipient. Spectra Logic does not save emailed configuration files.

- c. Enter a password, which is used to encrypt the key itself, select **Next**.



Figure 2-5 Security menu–Encryption Password screen.

- d. Make a record of the password, which you will need to import the key. Without it, you cannot import the key, and the data which was encrypted using the key will be inaccessible.

e. Confirm that the encrypted key copied correctly by using one of these methods:

- USB device—Select the **Check Key Files** button.

If the confirmation indicates the key did not copy correctly, delete all data from the USB device so that no trace of the failed key attachment remains, then re-export the key to a different USB device, beginning with Step 2.

- Emailed—Confirm the receipt of the attachment by contacting the user to whom you sent the encrypted key file and verifying receipt and validity of the key.

Partition Settings

1. Select **Configuration** ➤ **Partitions**. The Partitions screen appears.



Figure 2-6 Configuration menu–Partitions screen.

2. Select **Details** and write down all partition information (for each partition), including:

- Name of each partition
- Number of storage slots for each partition
- Number of drives for each partition
- Which tape drive acts as the “exporter” for the library
- Which tape drives, their physical location or their designation are configured for each partition

Network Information

1. Select **Configuration** → **Network**. The Network screen appears.

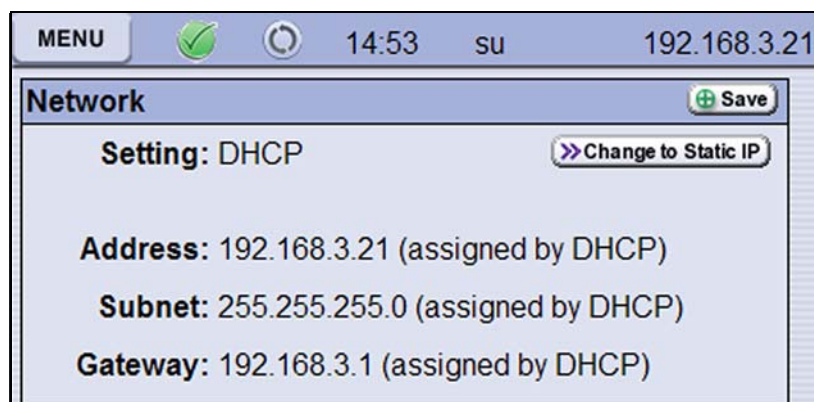


Figure 2-7 Configuration menu–Network screen.

2. Write down all of the Network information.

Email Users and SMTP IP Address

1. Select **Configuration** → **Mail Users**. The Mail Users screen appears.



Figure 2-8 Configuration menu–Mail Users screen.

2. Select **Edit** to see more details, including the SMTP IP address, and write down the information.

Figure 2-9 Configuration menu–SMTP IP screen.

3. Note which users receive which notifications (error, fatal, warning, and info).

AutoSupport Log (ASL) Profile

Gather the ASL information for *each* profile. Do not attempt to make any changes at this time; record any desired changes to implement after the replacement procedure is complete.

1. Select **Maintenance** → **AutoSupport** → **Manage Profile** → **Edit** to navigate through the wizard and record the information. The Company Info screen appears.

Figure 2-10 Maintenance menu–Company Profile screen.

2. Write down all information for each profile, including:
 - Contract number
 - Company name and site address
3. Select **Next** to view and record the contact name, phone number, and email address.

General Library Information

1. Select **Configuration** ----> **Settings** ----> to gather the general library settings.

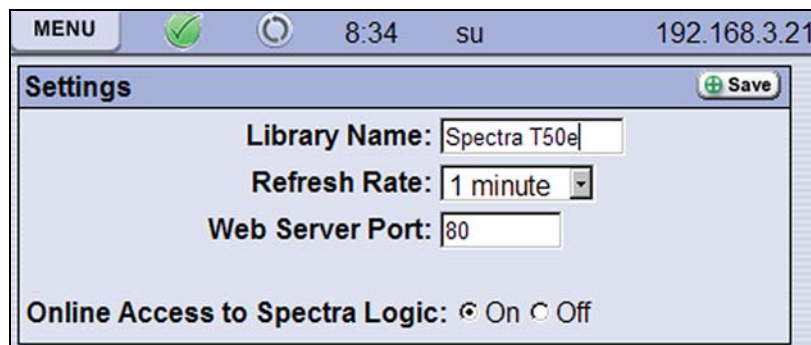


Figure 2-11 Configuration menu–Settings screen.

Users and Passwords

1. Select **Security** ----> **Edit Users** ----> **Edit** to gather the user settings.



Figure 2-12 Security menu–Settings screen.

2. Write down the user name, user type, and password of each user. Passwords are not shown, so write down the passwords, if they are known.

Create an Auto Support Log (ASL) File

The ASL creates a backup copy of your current configuration and gathers all the logs from the library. You can email the ASL file to SpectraGuard Support and they can provide you with the detailed information to reconfigure your library as a last resort. The only information not contained in this log file are the BlueScale logon passwords, and the Encryption keys. *The Encryption keys must be backed up or saved separately.*

If you do not have an AutoSupport Log Profile configured, creating one at this time may not work if either the LCM or the flash card are malfunctioning. If this is the case, make sure you record all the information in the previous sections to restore your library configuration after replacing the LCM or flash card.

Able to Create ASL If you are able to create a log, follow these steps:

1. Select **Maintenance** ... **Auto Support**. The Auto support screen appears.

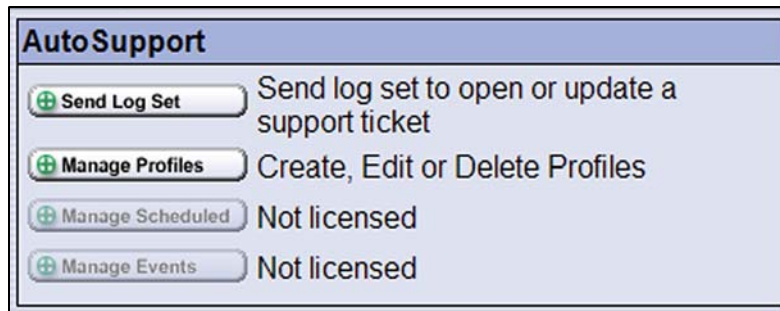


Figure 2-13 Maintenance menu–Auto Support screen.

2. Select **Send Log Set** and **Select** the appropriate profile.

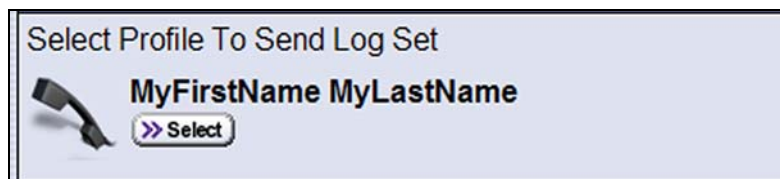


Figure 2-14 Auto Support Select Profile(s) screen.

3. Select **Create a new support ticket** and select **Next**.

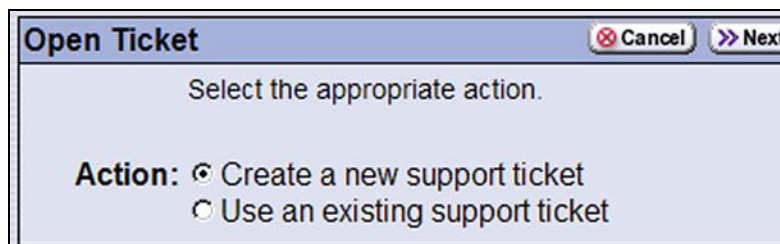
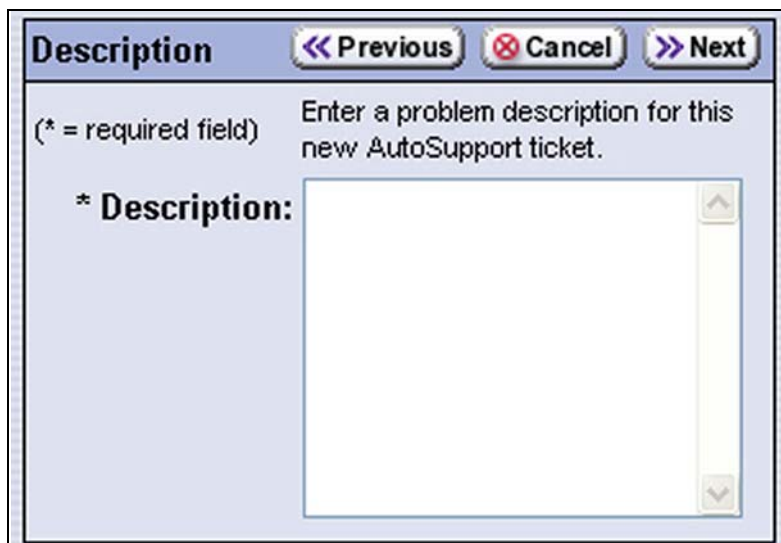


Figure 2-15 Auto Support Open Ticket screen.

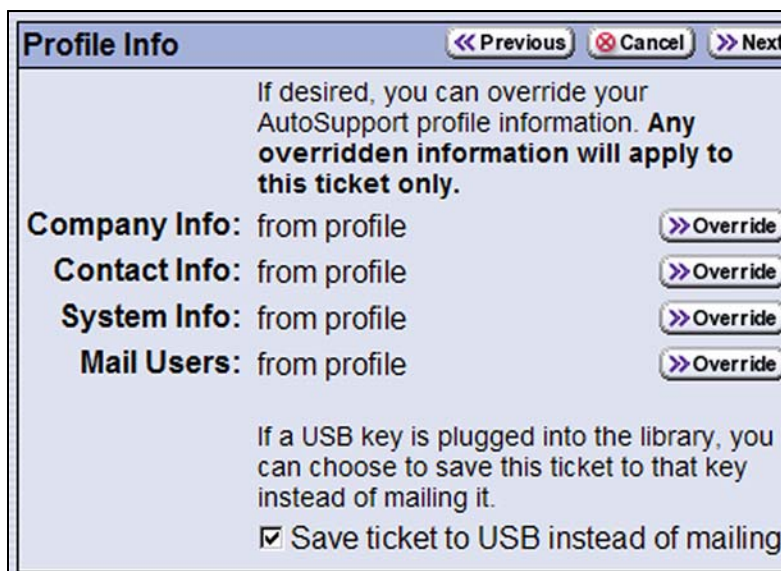
4. Use the keyboard to enter a description of the problem in the box. A description must be entered before the library allows you to continue. Enter the description and select **Next**.



The screenshot shows a software window titled "Description". At the top, there are three buttons: "<< Previous", "Cancel" (with a red X icon), and ">> Next". Below the title bar, on the left, is the text "(* = required field)". To the right of this is the instruction "Enter a problem description for this new AutoSupport ticket." Below the instruction, the label "* Description:" is followed by a large, empty text area with a vertical scrollbar on the right side.

Figure 2-16 Auto Support Ticket Description screen.

5. Preview the Profile Information and select **Next**. Do not attempt to make any changes at this time; record any desired changes to implement after the replacement procedure is complete.



The screenshot shows a software window titled "Profile Info". At the top, there are three buttons: "<< Previous", "Cancel" (with a red X icon), and ">> Next". Below the title bar, the text reads: "If desired, you can override your AutoSupport profile information. Any overridden information will apply to this ticket only." Below this text, there are four rows of information, each with an "Override" button to its right:

- Company Info: from profile
- Contact Info: from profile
- System Info: from profile
- Mail Users: from profile

At the bottom of the window, there is a note: "If a USB key is plugged into the library, you can choose to save this ticket to that key instead of mailing it." Below this note is a checkbox that is checked, with the text "Save ticket to USB instead of mailing."

Figure 2-17 Auto Support Profile Info screen.

6. The **Summary** page displays.
7. Save the information using one of these options:
 - Save to a USB device, if possible (this is the recommended method)

Important! Verify that all of the information that you saved to the USB device is available on the device before proceeding.

- E-mail the information to the desired recipient and verify that they received a valid copy of the information.

Unable to Create ASL If your LCM or flash card is malfunctioning, you might not be able to generate an AutoSupport Log (ASL). If you are unable to generate an ASL, make a note of all of your configured information.

1. Select **Maintenance** ... **AutoSupport** ... **Send Log Set** ... **Next** ... (through the screens to the Profile Info screen) ... **Override** button to view the information for each heading.

Profile Info << Previous Cancel >> Next

If desired, you can override your AutoSupport profile information. **Any overridden information will apply to this ticket only.**

Company Info: from profile	>> Override
Contact Info: from profile	>> Override
System Info: from profile	>> Override
Mail Users: from profile	>> Override

If a USB key is plugged into the library, you can choose to save this ticket to that key instead of mailing it.

☒ Save ticket to USB instead of mailing.

Figure 2-18 Auto Support Profile Override Info screen.

2. Make a note of all of the information (especially your contract number).

Company Info Cancel >> Next

(* = required field) Enter the company information for this AutoSupport profile.

* **Company:** ABC Company

* **Address 1:** 123 Main Street

Address 2: Anytown, CO

Library Location: Building 3

* **Contract #:** 123456 (6 digits)

Figure 2-19 Maintenance menu–Company Profile screen.

Replacing the LCM

Removing the LCM

1. Power off the library—press and hold the front panel power button for one second. The power-off sequence takes approximately two minutes while the library allows applications to shut down gracefully.



Figure 2-20 LCM replace—power off the library.

2. Disconnect any cables connected to the LCM and remove any USB devices, if present.
3. Loosen the finger screws securing the LCM to the chassis by hand or with a #2 Phillips screwdriver (Figure 2-21).

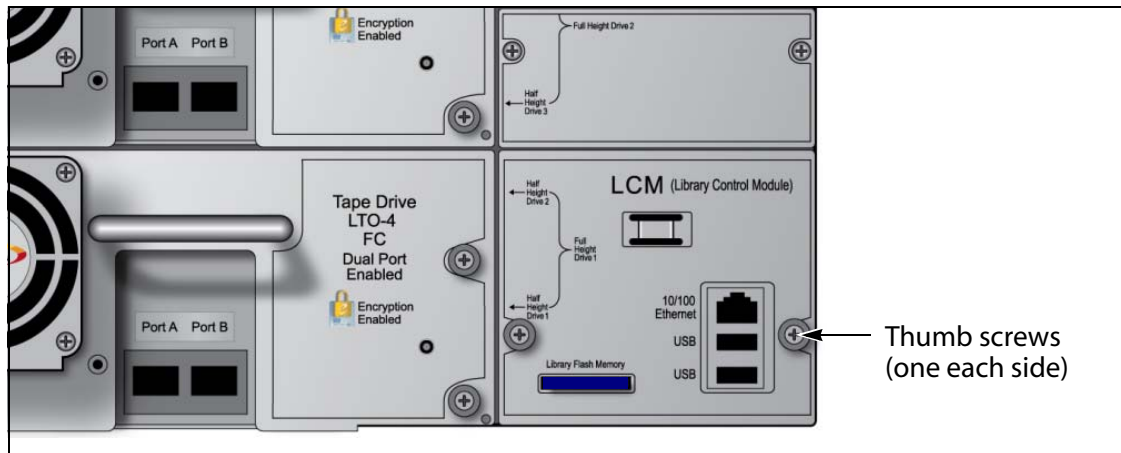


Figure 2-21 Remove the screws securing the LCM to the chassis.

4. Grasp the thumb screws and pull the LCM directly toward you to slide it out of the chassis.
5. Set the LCM aside for return to Spectra Logic.

Installing the LCM

1. Remove the new LCM from the packaging.

Note: Keep the packaging to return the old LCM to Spectra Logic.

2. Slide the new LCM into the empty slot.
 - a. Align the two edges of the LCM card with the guide slots in the chassis.

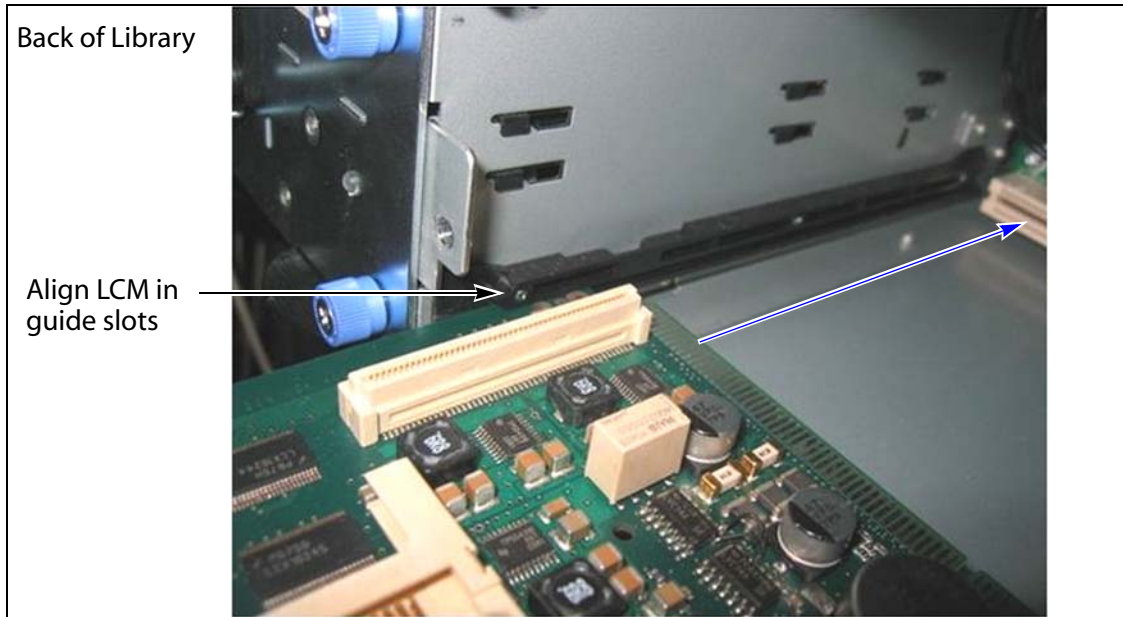



Figure 2-22 Align the LCM in the guide slots in the chassis.

- b. Push the LCM it in until it is flush against the chassis. The pressure needed is about the same as when installing RAM in a computer. If the card does not “snap” into place, verify that the LCM card edges are aligned in the guide slots.
3. Tighten the two screws using a #2 Phillips screwdriver or your fingers, shown in Figure 2-21, to secure the LCM to the chassis.

Note: The new LCM ships from the factory with a new flash card. If the card is not installed or is loose, gently push the card into the open slot until it snaps (clicks) into place.

The card inserts easily when it is oriented correctly. Do not force it.

Caution:  Do not install the flash card from the LCM you replaced unless directed to do so by SpectraGuard Technical Support. Installing a corrupted flash card can cause the new LCM to fail.

4. Power on the library via the front panel (see Figure 2-20).

- a. Press and hold the front panel power button for two to three seconds until the button's LED illuminates.
 - b. Wait while the library completes its power-on sequence, which takes six to nine minutes, depending on the library configuration.
5. Calibrate the front panel—After the power-on initialization, the calibration screen displays. When this screen appears, select **Next**. *It is important for you to use the stylus to calibrate the front panel, and not your fingers.*

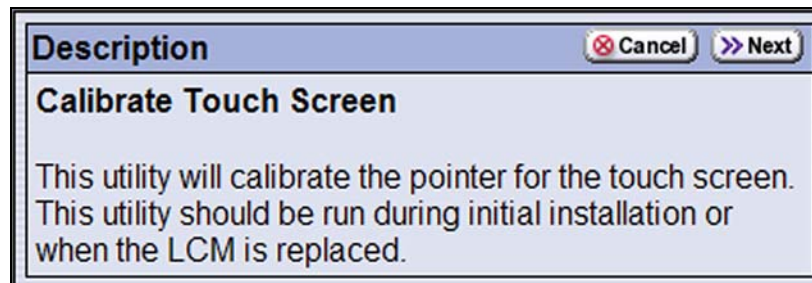


Figure 2-23 Maintenance menu—Calibrate Touch screen.

Note: To properly calibrate the touch screen, press and hold the stylus on the “+” for two to three seconds. Do not use excessive force.

The BlueScale user interface is again available through the front panel. You need to set up your Networking configuration to access BlueScale through a web browser.

Note: It may be necessary to upgrade firmware on the LCM. See the *Spectra T50e Library User Guide* for detailed information about performing firmware upgrades. The LCM must reboot after a firmware upgrade, which will interrupt backups.

6. Package the old LCM and ship it to Spectra Logic as described in *Returning Components* on page 77.

Replacing the Flash (SD) Card

Removing the Flash Card

Follow these steps to remove the card:

1. Power off the library—Press and hold the front panel power button for one second (see Figure 2-20). The power-off sequence takes approximately two minutes while the library allows applications to shut down gracefully.

2. Push the flash card in until you feel it click, let it eject a short distance out of the library, and then pull it gently out of the slot.

If Support requests that you return the card, place it in a padded envelope mailer and mail it to Spectra Logic (see *Shipping RMA Returns* on page 79 for the mailing address).

If you are not asked to return the component, dispose of it in the same manner as other electrical components, such as computer monitors and keyboards.

Installing the Flash Card

Follow these steps to install the card:

1. Access the back of the library (see Figure 2-24).
2. Orient the card with the exposed contacts down and toward the front of the library, as shown here.

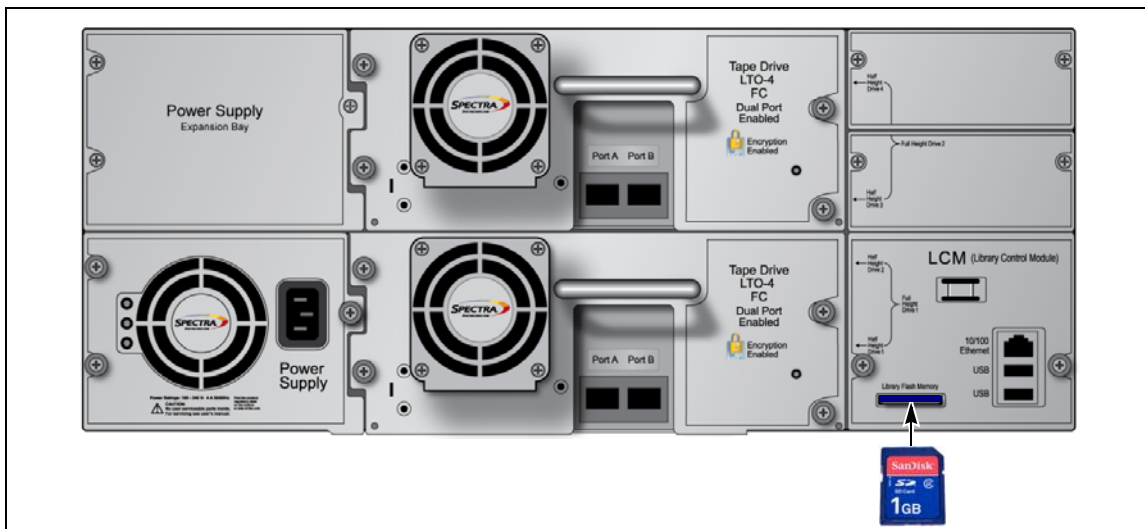


Figure 2-24 Flash card orientation.

3. Gently push the card into the open slot until it snaps (clicks) into place.

Note: The card inserts easily when it is oriented correctly. Do not force it.

4. Power on the library via the front panel (see Figure 2-20).
 - a. Press and hold the front panel power button for two to three seconds until the button's LED illuminates.
 - b. Wait while the library completes its power-on sequence, which takes six to nine minutes, depending on the library configuration.

5. Calibrate the front panel—After the power-on initialization, the calibration screen displays. When this screen appears, select **Next**. *It is important for you to use the stylus to calibrate the front panel, and not your fingers*

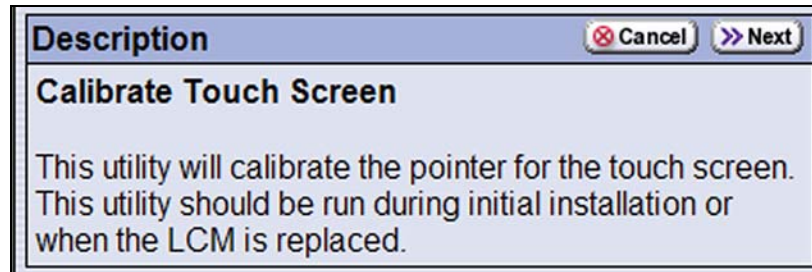


Figure 2-25 Maintenance menu—Calibrate Touch screen.

Note: To properly calibrate the touch screen, press and hold the stylus on the “+” for two to three seconds. Do not use excessive force.

Restoring the Library Configuration

After the library restarts, restore the partition definitions and library configuration settings using one of the following methods.

- **Via USB**—Restore the configuration you previously saved to a USB storage device or uploaded to a file on a computer.

Note: If you were unable to save the configuration to a USB, reconfigure the library using the information that you wrote down in *You do not have a Valid Backup Library Configuration* on page 20.

- **Via Flash Card**—If SpectraGuard Support directs you to do so, remove the card from the LCM you replaced and install it in the new LCM flash card slot (see Figure 2-8).
- **Via the Remote Library Controller (RLC)**—Re-enter the partition configurations and other library configuration settings as described below.

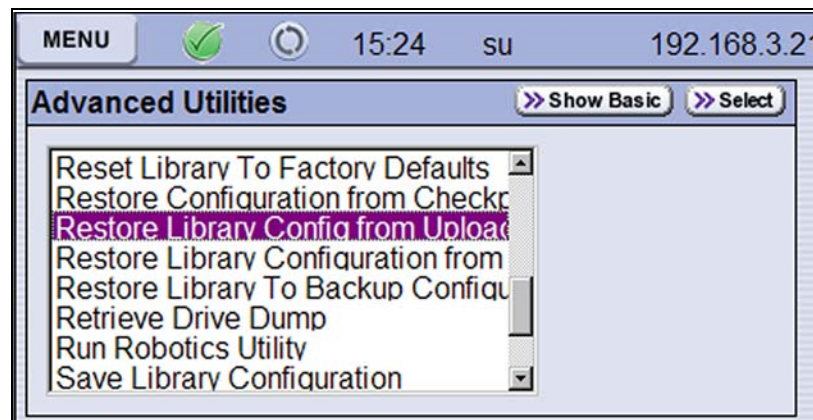
Restoring the Configuration via USB

1. Insert the USB device with the saved configuration into one of the USB ports in the back of the library (see Figure 2-24).
2. Select **Maintenance** → **Utilities** → **Tools** → **Advanced** → **Next**.
3. Select the **Restore Configuration from USB and RUN this test**. The library power-cycles after this utility completes.

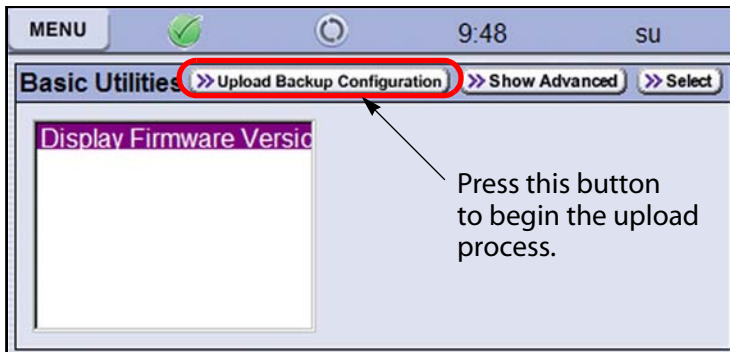
If you do not have a saved configuration on the USB device, but have one saved in email or on your local system, you must set up networking and then access the library via the RLC to restore the configuration saved in email or on your local system.

Restoring the Configuration via the RLC

1. Log into the library front panel with superuser or administrator privileges.
2. Determine your network address requirements (Static or Dynamic).
 - Dynamic IP addressing is the default setting.
 - To change the address to static, select **Menu** → **Configuration** → **Network**. Set the static address.
3. Select **Maintenance** → **Utilities** → **Show Advanced** → **Yes**. The Utilities screen refreshes to show the advanced utilities.



4. Scroll through the options and select the one that is most suitable for your situation:

Option	Use this option to...
Restore Configuration from Checkpoint	Restore the configuration from the last firmware update.
Upload Backup Configuration^a	<p>Upload a configuration file that you previously saved on a computer to a temporary location in the library memory.</p>  <p>Note: If you used this option, you must then run the Restore Library Configuration from Backup Uploaded File utility to restore the library configuration.</p>
Restore Library Configuration from Uploaded File^{a b}	<p>Complete the restore process started by Upload Backup Configuration by uploading a saved configuration file from a computer using the RLC.</p> <p>Note: This option is used in conjunction with Upload Backup Configuration, which must be completed first.</p>

a. These options are only available when you access the library from a web browser using the RLC.

b. Please note that this option may not be possible until you configure your library network settings.

5. Press **Select**. The screen refreshes to show the details for the selected utility.
6. Select **Run** to execute the utility. After a brief delay, the Utility Results screen appears, showing that the configuration file was uploaded and/or the configuration restored.

Note: Running any one of these utilities requires the library to reboot.

Restoring the Configuration via Gathered Information

If there is no stored configuration, or if the restoration of the configuration from the USB key fails, follow the procedures outlined in the *Spectra T50e Library User Guide* to build new partitions and to program the necessary user settings. Use the information that you gathered in *You do not have a Valid Backup Library Configuration* on pages page 20 to page 29.

Rebuild the configuration in this order:

1. Option keys
2. Encryption keys
3. Partitions
4. Networking
5. Email and SMTP information
6. Date and Time
7. Settings
8. AutoSupport Log profiles
9. Users and passwords

Restarting Backups

After you restore the library configuration and the library finishes rebooting, use your backup software to restart any backup processes.

Storing Configuration Changes

Spectra Logic recommends that you always store a copy of the current library configuration on a USB device. Any time you make a change to a partition parameter, the library asks you to save the configuration change to a USB device; Spectra Logic recommends taking advantage of this feature.

Notes

3 Replacing a Power Supply Module

This chapter describes how to replace a power supply in a Spectra T50e library.

Gathering Tools and Supplies

Ensure that the work area is free from conditions that could cause electrostatic discharge (ESD). Discharge static electricity from your body by touching a known grounded surface, such as a computer's metal chassis.

You need the following tools and supplies to install the power supply:

- A new power supply kit from Spectra Logic
- A power cable (included in the kit)
- A #2 Phillips screwdriver

Continuing Backups

If your library has:

- Only one power supply module installed—backups are interrupted when the power supply malfunctions and cannot resume until the power supply is replaced. In this case, you must power-off the library as the first step in the procedure. See *Replacing the Power Supply* on page 40.
- Two power supply modules installed for N+1 redundancy and one power supply fails or is removed—backups can continue while you replace the malfunctioning power supply. See *Installing a Redundant Power Supply* on page 41.

Replacing the Power Supply

Follow these steps to replace the single power supply (see Figure 3-1 and Figure 3-2).

1. **Prepare the library**—Ensure that the library is not performing a task by observing that the BlueScale User Interface on the front panel is idle.
 - a. Press the front panel power button. The power-off sequence takes approximately two minutes while the library allows applications to shut down gracefully.



Figure 3-1 Power supply replace—power off the library.

- b. Access the back of the library and disconnect the power cord.
2. **Remove the power supply**—Loosen the finger screws by hand or with a #2 Phillips screwdriver and slide the power supply straight out of the library.

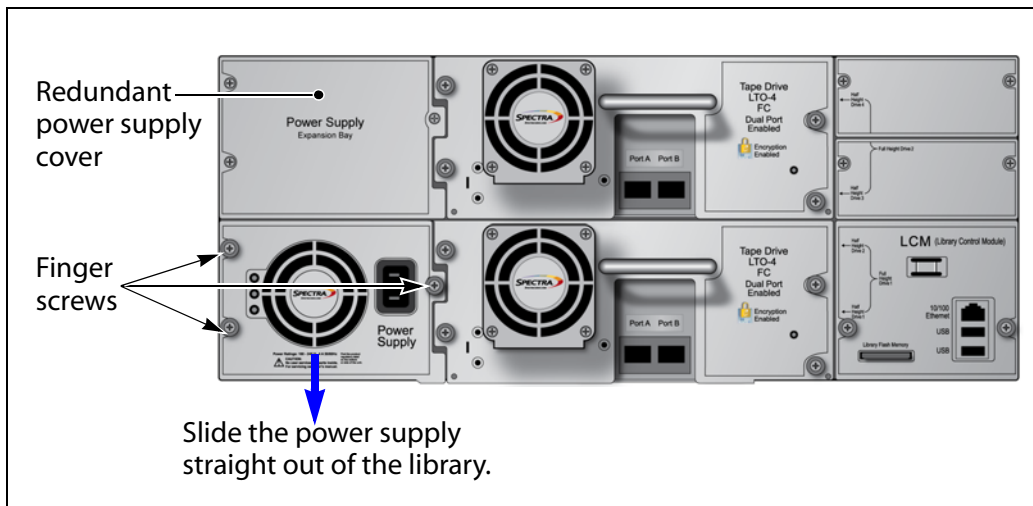


Figure 3-2 Remove the power supply.

Note: After removing the new power supply from its packaging, keep the packaging to return the old power supply to Spectra Logic.

3. **Install the replacement power supply**—Slide the new power supply straight into the library.
 - a. Secure the power supply by tightening the finger screws.
 - b. Connect one end of the power cord to the power supply and the other end to an outlet.
 - c. Press and hold the front panel power button for two to three seconds to power on the library. Wait while the library completes its power-on sequence, which takes from six to nine minutes depending on your library configuration.
4. Package the power supply module and ship it to Spectra Logic as described in *Chapter 6 – Returning Components* on page 77.

Installing a Redundant Power Supply

Note: Redundant power supplies are “hot pluggable” (you do not need to power off the library to perform this procedure).

Follow these steps to install the power supply.

1. **Prepare the library**—Access the back of the library.

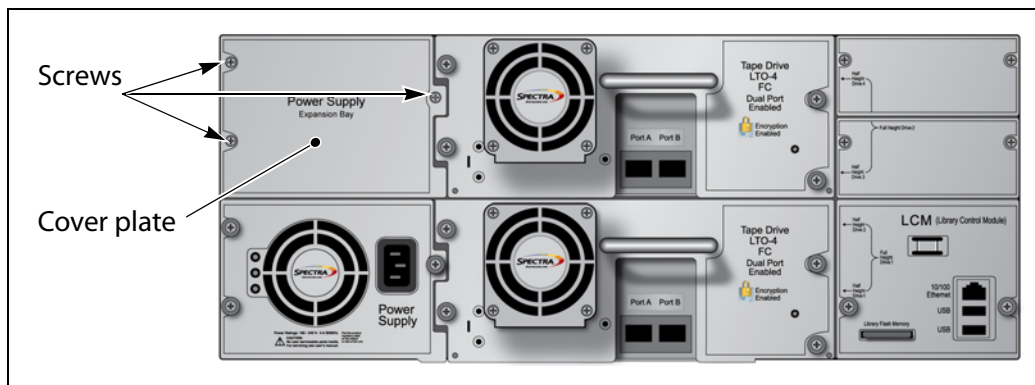


Figure 3-3 Power supply cover plate.

- a. Remove the screws securing the cover plate using a #2 Phillips screwdriver.
 - b. Set the plate and screws aside for future use.
2. **Install the power supply**—Slide the new power supply straight into the opening.

- a. Gently push the power supply in until it fully seats itself in the library.

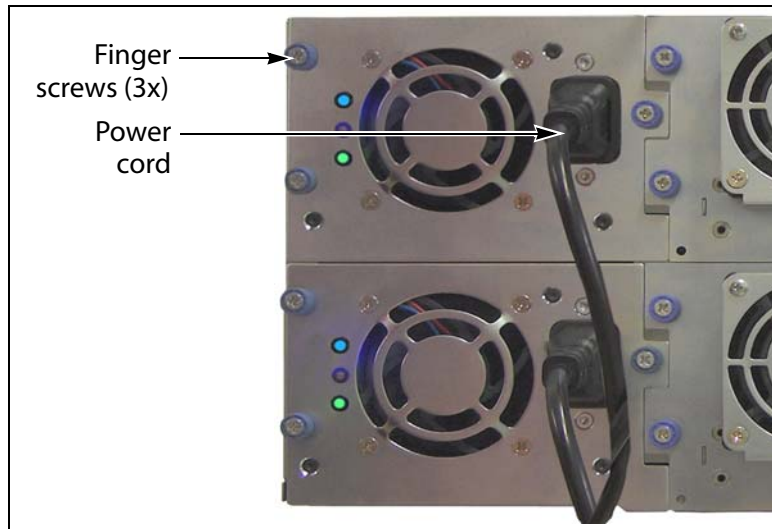


Figure 3-4 Power supply connections

- b. Secure the power supply by tightening the finger screws.
- c. Connect one end of the power cord to the power supply and the other end to an outlet.

Note: Connect each of the library's AC inputs to a separate circuit. Using separate circuits allows for failover in the event of a power failure in one of the circuits. The failover feature requires the N+1 power redundancy option.

Your power supply is installed and you can resume operation.

Restarting Backups

If necessary, use your backup software to restart any backups that were stopped when the power supply malfunctioned.

4 Replacing or Cleaning a Tape Drive

Tape drives are installed in drive bays in the back of the T50e library. This chapter provides the instructions for installing, replacing, removing, and cleaning tape drives.

Be sure to read the introductory sections in this document before performing any of these procedures.

- *Installing an Additional Tape Drive* on page 46
- *Replacing an Existing Tape Drive* on page 50
- *Removing an Existing Tape Drive* on page 54
- *Cleaning a Tape Drive Manually* on page 57

Before You Begin

The Spectra T50e library currently supports LTO tape drives. Each tape drive is mounted on a drive sled that provides the electrical and logical connections to the library.

- **Serial Number**—The drive sled includes intelligence that assigns a serial number to the tape drive based on its location in the library. This location-based serial number remains constant even if the physical tape drive is replaced. The new tape drive simply retains the designated serial number, so tape drive replacement is completely transparent to the backup software.
- **SCSI ID**—When you *replace* a SCSI tape drive in the library with a new SCSI tape drive, the new tape drive assumes the SCSI ID of the old tape drive.
- **WWN**—When you *replace* a Fibre Channel (FC) tape drive in the library with a new FC tape drive, the new tape drive assumes the WWN of the old tape drive.

- **Fan and Handle**—In addition to the electrical connections for the tape drive, the drive sled includes a fan to provide additional cooling to the tape drive and a handle to simplify sliding it in or out of a drive bay.



Figure 4-1 Half-height tape drive in sled.

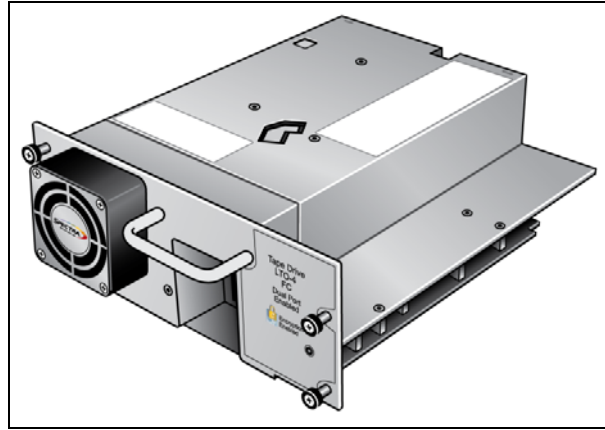



Figure 4-2 Full-height tape drive in sled.

Preparing for Installation or Replacement

Ensure that the environment is free of conditions that could cause electrostatic discharge (ESD)—If possible, use an antistatic mat and a grounded static protection wristband during installation. If a mat and wristband are not available, touch a known grounded surface, such as a computer's metal chassis.

Caution:  If you are replacing a tape drive, the new tape drive must be the same type as the one you replace. Compare the part number on the box and on the tape drive to verify that the tape drive is the same type.

- LTO-4 Full-height Fibre Channel tape drive: P.N. 90979468
 - LTO-4 Half-height SCSI tape drive: P.N. 90979469
 - LTO-3 Full-height SCSI tape drive: P.N. 90979470
-

Gathering Tools and Supplies

You need the following tools and supplies to install or replace a tape drive:

- A new tape drive in a Spectra Logic drive carrier
- A #2 Phillips screwdriver

- Acquire the appropriate interface cable for your tape drive:
 - LTO-3 SCSI tape drive—one high-density (HD), wide (68-pin), LVD SCSI cable
 - LTO-4 SCSI tape drive—one 68-pin VHDCI SCSI cable
 - Dual port LTO-4 Fibre Channel tape drive—one optical Fibre Channel cable for each port that you plan to use. Use either 50-micron or 62.5-micron multi-mode optical fiber cables with dual single-channel (LC) connectors.
- A SCSI terminator for the SCSI tape drives
 - LTO-3 LVD SCSI—One wide Ultra 3 Active SCSI terminator is required for each SCSI bus you will connect to the library.
 - LTO-4 VHDCI SCSI—One VHDCI SCSI terminator is required for each tape drive. Do not daisy-chain LTO-4 SCSI tape drives.

Note: Replacement tape drives do not ship with a terminator. New tape drives do ship with a terminator.

Following Backup Guidelines


Fibre Channel tape drives Backups running to other tape drives in the library (or partition) can safely continue during the replacement of the malfunctioning drive, as long as that tape drive is not the one exporting the library (that is, providing the robotic control path for the partition). If the malfunctioning tape drive is providing the control path for the robotics, stop backup operations to the partition.

SCSI tape drives If two SCSI tape drives are daisy-chained on the same SCSI bus, removing a tape drive interrupts communications on the bus.

- **Two tape drives daisy-chained (LTO-3 only)**—Before removing a tape drive, stop backup operations to both of the tape drives in the daisy chain.
- **Single tape drive (LTO-3 or LTO-4), or not daisy-chained**—If the malfunctioning tape drive is providing the control path for the robotics, stop backup operations.

Following the Host Power-off Recommendation

Spectra Logic recommends that you shut down and power-off the host before installing or replacing a tape drive.

Caution:  Improperly adding or removing a device from a SCSI bus can cause the host computer to crash. If you leave the host running during this procedure, Spectra Logic assumes no responsibility for damage to data or equipment.

Powering the Library On

If the library is not already powered on, power it on by pressing the front panel power button for two to three seconds. Wait while its power-on sequence completes.

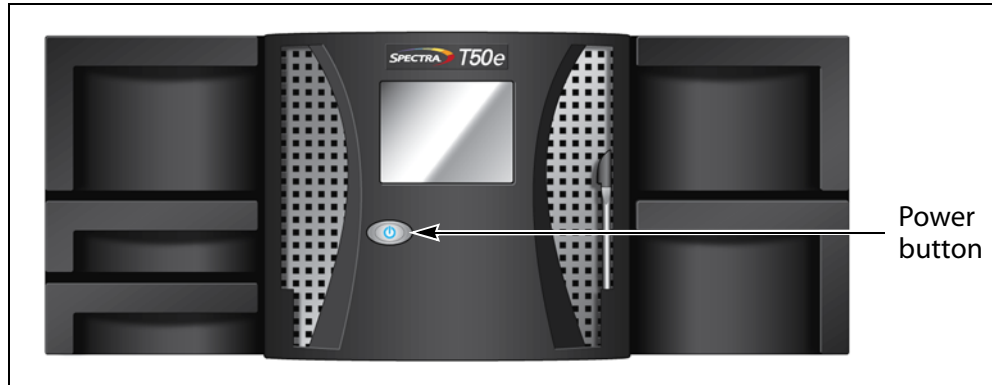




Figure 4-3 Power button

Installing an Additional Tape Drive

This section describes how to install an additional tape drive and configure it for use.

If you are installing a direct-attach SCSI tape drive, Spectra Logic recommends that you shut down and power-off the host before installing the tape drive.

Caution:  Improperly adding or removing a device from a SCSI bus can cause the host computer to crash. If you leave the host running during this procedure, Spectra Logic assumes no responsibility for damage to data or equipment.

Caution:  The new tape drive must be the same type as the other tape drives installed in the library.

1. Power the library on, if desired.

If the library is not powered on when you begin this procedure, skip to Step 3, **Install the Tape Drive**.

After the installation is complete, power on the library, and then power on the host. During the initialization process, the host “discovers” the new tape drive.

2. **Select your option from the front panel menu**—After the library completes its initialization process, access the front panel menu.

- a. Access the front panel menu and log in as a superuser or administrator.
- b. From the main menu, go to **Configuration** → **Drives**.



- c. Press **Add** to the tape drive location where you plan to install the tape drive.



Note: Tape drives should be installed from bottom to top (see Figure 4-4).

3. **Install the tape drive**—Access the back of the library.

- a. Remove the tape drive cover plate using a #2 Phillips screwdriver (Figure 4-4, step a). Set the plate and screws aside for use in the future.

Note: If you are installing the bottom tape drive, locate the product ID slide below the drive carrier, pull it forward, and push it down slightly to prevent damage while installing or removing the tape drive.

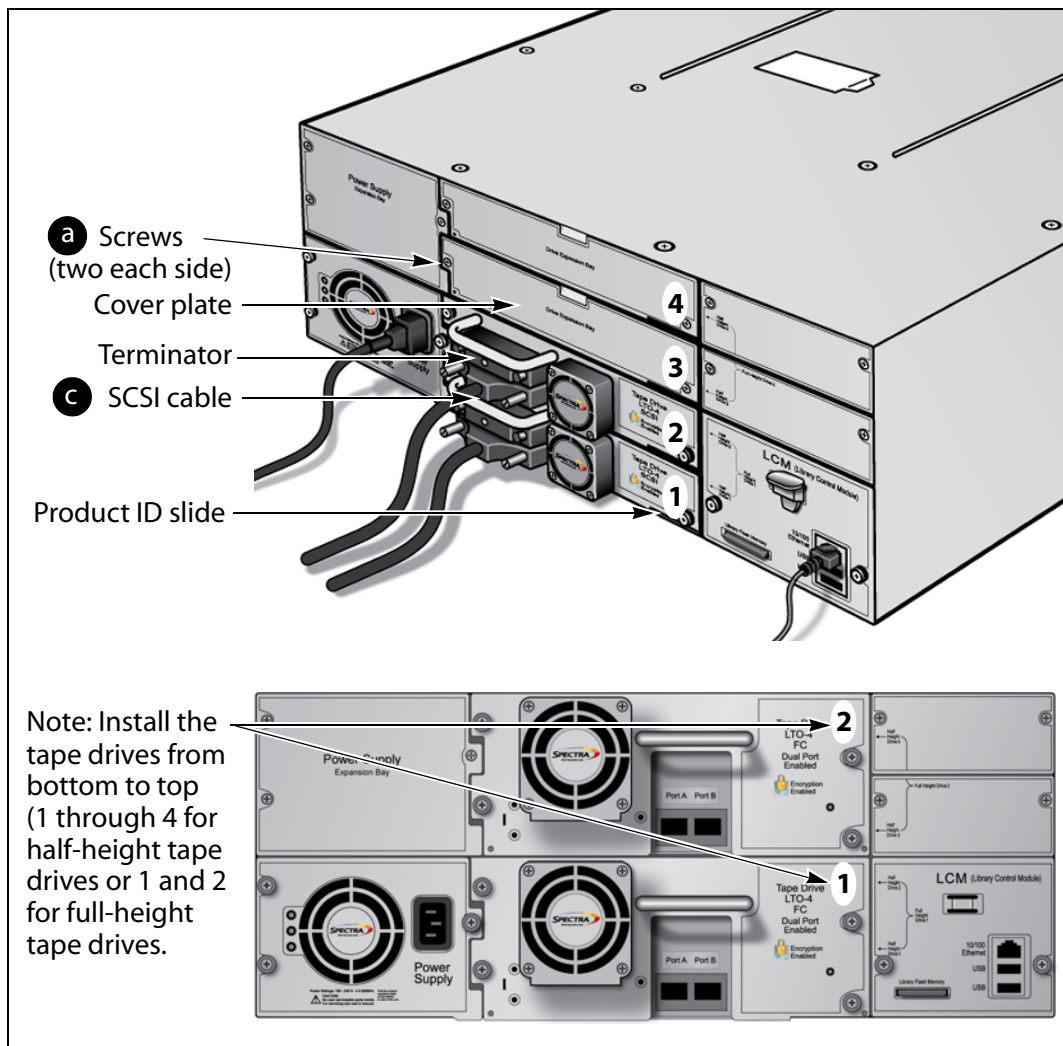
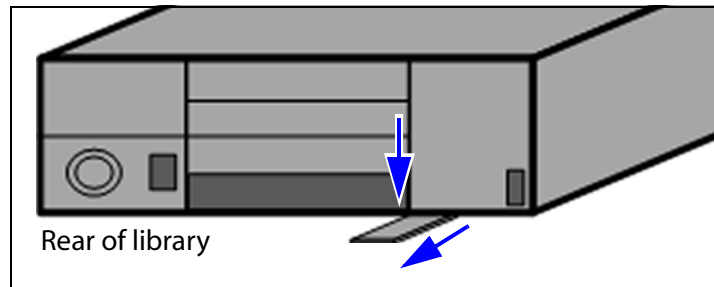


Figure 4-4 Rear panel – Add tape drive

- b. Carefully slide the tape drive assembly into the open bay. Align the connectors and gently push the tape drive in until it “seats” itself in the back of the library. Secure the tape drive by tightening the finger screws.

Note: Wait for the tape drive to initialize (this can take several minutes). If you push any other buttons on the front panel before initialization completes, you will cause an error.

- c. Connect the interface cable (SCSI or Fibre Channel) and a terminator.
 - LTO-3 SCSI tape drive—connect a terminator if this is the last SCSI device on the SCSI bus (Figure 4-4, step c).
 - LTO-4 SCSI tape drive—connect a terminator on the second SCSI connector on the tape drive. Do not daisy-chain LTO-4 SCSI tape drives.
4. **Complete the installation**—When the Feedback screen displays, select **OK** to continue operation.

Note: This step assumes that the library was powered on when you performed this procedure. If the library was not powered on, power on the library now, and then power on the host. During the initialization process, the host “discovers” the new tape drive.





5. Configure a partition to add the new tape drive to it (see the *Spectra T50e User Guide* for instructions).
6. Once the library, or partition is configured with the new tape drive, power up your host system and verify the system sees the new tape drive.

Replacing an Existing Tape Drive

This section describes how to replace an existing tape drive in the library and configure it for use. Refer to Figure 4-4 to determine the location of the tape drive you plan to replace.

If you are replacing a direct-attach SCSI tape drive, Spectra Logic recommends that you shut down and power-off the host before installing the tape drive.

Caution:  Improperly removing a device from a SCSI bus can cause the host computer to crash. If you leave the host running during this procedure, Spectra Logic assumes no responsibility for damage to data or equipment.

Caution:  The new tape drive must be the same type as the other tape drives installed in the library.

1. **Remove the cartridge from the tape drive**—If the malfunctioning tape drive contains a cartridge, attempt to move the cartridge to an empty slot in a magazine. See the *Spectra T50e User Guide* (Cartridge Use) for instructions.


Continue with the replacement even if you are unable to unload the cartridge.

2. Power the library on, if needed.
3. **Select your option from the front panel menu**—Access the front panel menu and log in as a superuser or administrator.
 - a. From the main menu, go to **Configuration** ➤ **Drives**.



- b. Press **Replace** next to the tape drive that you plan to replace.



Caution:  *Do not select **Remove**. This option permanently removes the tape drive from the partition. When the replacement tape drive is installed, it will not be assigned to the partition from which the malfunctioning tape drive was removed.*

*If you select **Remove** and the selected tape drive is the only tape drive in the partition, the partition will be deleted.*

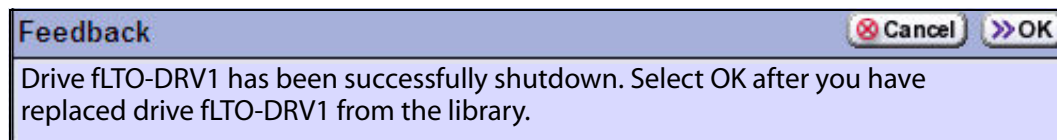
*Select **Replace** to transfer the partitioning information to the new tape drive.*

- c. A Feedback screen prompts you to confirm that you want to replace the tape drive. Press **OK** to continue or **Cancel** to cancel the action.



- d. Allow the library time to shut down the tape drive. Watch the front panel for a Feedback screen indicating that the tape drive has been successfully shut down.

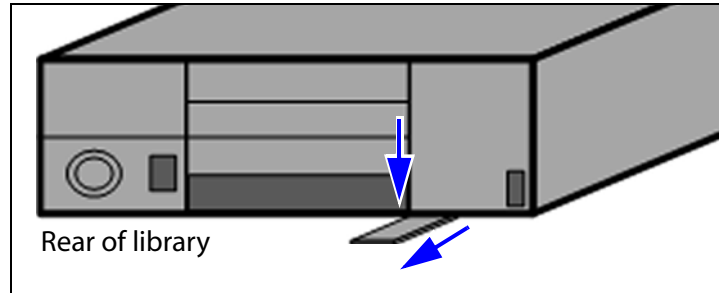
Note: Do not respond to the prompt in the Feedback screen or perform any other operations from the user interface (either locally or remotely) until you complete the replacement procedure. Responding before you replace the tape drive will power on and configure the tape drive you just powered down.



4. **Remove the tape drive**—Access the back of the library.

- a. Disconnect the interface cable (SCSI or FC) and the terminator, if one is installed (Figure 4-5, step a).

Note: If you are replacing the bottom tape drive, locate the product ID slide below the drive carrier, pull it forward, and push it down slightly to prevent damage while installing or removing the tape drive.



- b. Unscrew the screws, grasp the handle, and pull the tape drive straight toward you while you support it with both hands (Figure 4-5, step b).

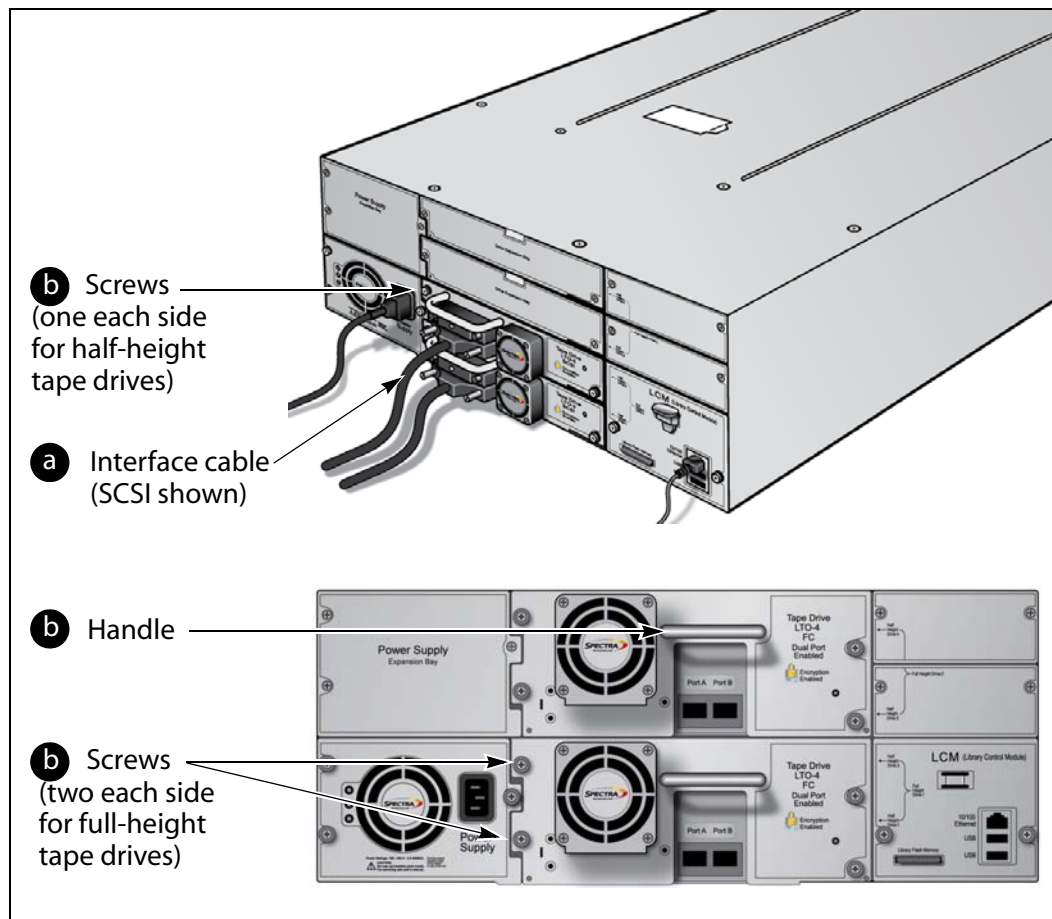


Figure 4-5 Rear panel – Replace tape drive

5. Install the replacement tape drive—See Figure 4-5 and Important note following Step 4 for reference.

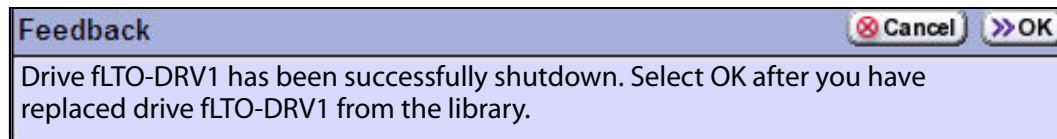
- a. Remove the replacement tape drive from its packaging.

Note: After removing the new tape drive from its packaging, keep the packaging to return the old tape drive to Spectra Logic.

- b. Carefully slide the tape drive assembly into the opening. Align the connectors and gently push the tape drive until it “seats” itself in the back of the library. Secure the tape drive by tightening the finger screws.
- c. Connect the interface cable (SCSI or FC) and a terminator. Use the cables and terminator from the tape drive that you are replacing.
 - LTO-3 SCSI tape drive—connect a terminator if this is the last SCSI device on the SCSI bus (Figure 4-5, step a).
 - LTO-4 SCSI tape drive—connect a terminator on the second SCSI connector on the tape drive. Do not daisy-chain LTO-4 SCSI tape drives.

Note: Wait for several minutes for the tape drive to initialize. If you push any other buttons on the front panel before initialization completes, you will cause an error.

6. Complete the replacement—Return to the Feedback screen displayed on the user interface and select **OK**.



The library powers on the new tape drive and begins the process of configuring it. A window displays showing the progress.

When the configuration is complete, the Drives screen refreshes to show the new tape drive functioning in the old tape drive's location. The new tape drive assumes the old tape drive's configuration, so it can be used immediately.

7. Package the malfunctioning tape drive and ship it to Spectra Logic as described in *Returning Components* on page 77.

Testing the Tape Drive

1. Power on and restart the host computer, if you powered it off.
2. Ensure that your operating system sees the tape drive and robotics for the library before proceeding.

3. Determine whether your backup software and tape drive are communicating properly by using the software to back up several megabytes of data to the tape drive. Perform a comparison check on the backup data to confirm that it was written correctly.


Restarting Backups

Use your backup software to restart any backup processes that had been running to the replaced tape drive. This restart ensures that the software recognizes the tape drive as working and available.

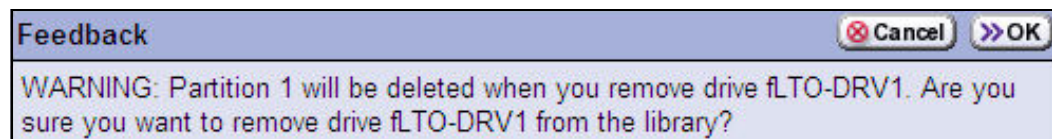
Removing an Existing Tape Drive

This section describes how to remove an existing tape drive from the library.

If you are removing a direct-attach SCSI tape drive, Spectra Logic recommends that you shut down and power-off the host before removing the tape drive.

Caution:  Improperly removing a device from a SCSI bus can cause the host computer to crash. If you leave the host running during this procedure, Spectra Logic assumes no responsibility for damage to data or equipment.

Note: If you select **Remove** and the selected tape drive is the only tape drive in the partition, the partition will be deleted.



1. **Remove the cartridge from the tape drive**—If the tape drive you wish to remove contains a cartridge, attempt to move the cartridge to an empty slot in a magazine. See the *Spectra T50e User Guide* (Cartridge Use) for instructions.

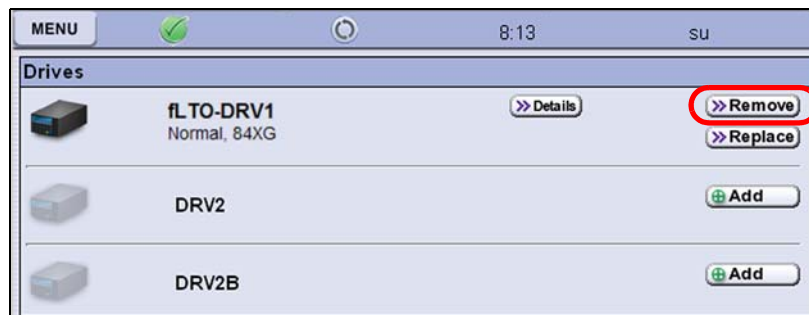
Continue with the replacement even if you are unable to remove the cartridge.

2. Power the library on, if needed.
3. **Select your option from the front panel menu**—Access the front panel menu and log in as a superuser or administrator.

- a. From the main menu, go to **Configuration** ➤ **Drives**.

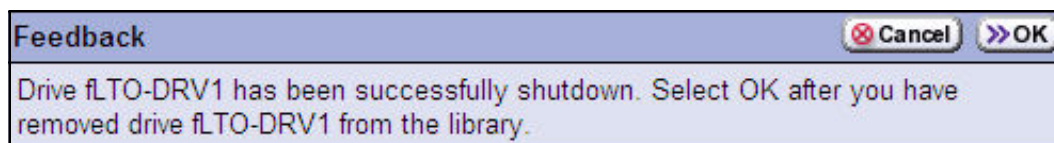


- b. Press **Remove** next to the tape drive that you plan to remove.



- c. Allow the library time to shut down the tape drive. Watch the front panel for a Feedback screen indicating that the tape drive has been successfully shut down. After it appears, continue with the next step.

Note: Do not respond to the prompt in the Feedback screen or perform any other operations from the user interface (either locally or remotely) until you complete the replacement procedure. Responding before you remove the tape drive will power on and configure the tape drive you just powered down.



4. **Remove the tape drive**—Access the back of the library.

- a. Disconnect the interface cable (SCSI or FC) and the terminator, if one is installed (Figure 4-6, step a).
- b. Unscrew the screws, grasp the handle, and pull the tape drive straight toward you while you support it with both hands (Figure 4-6, step b).

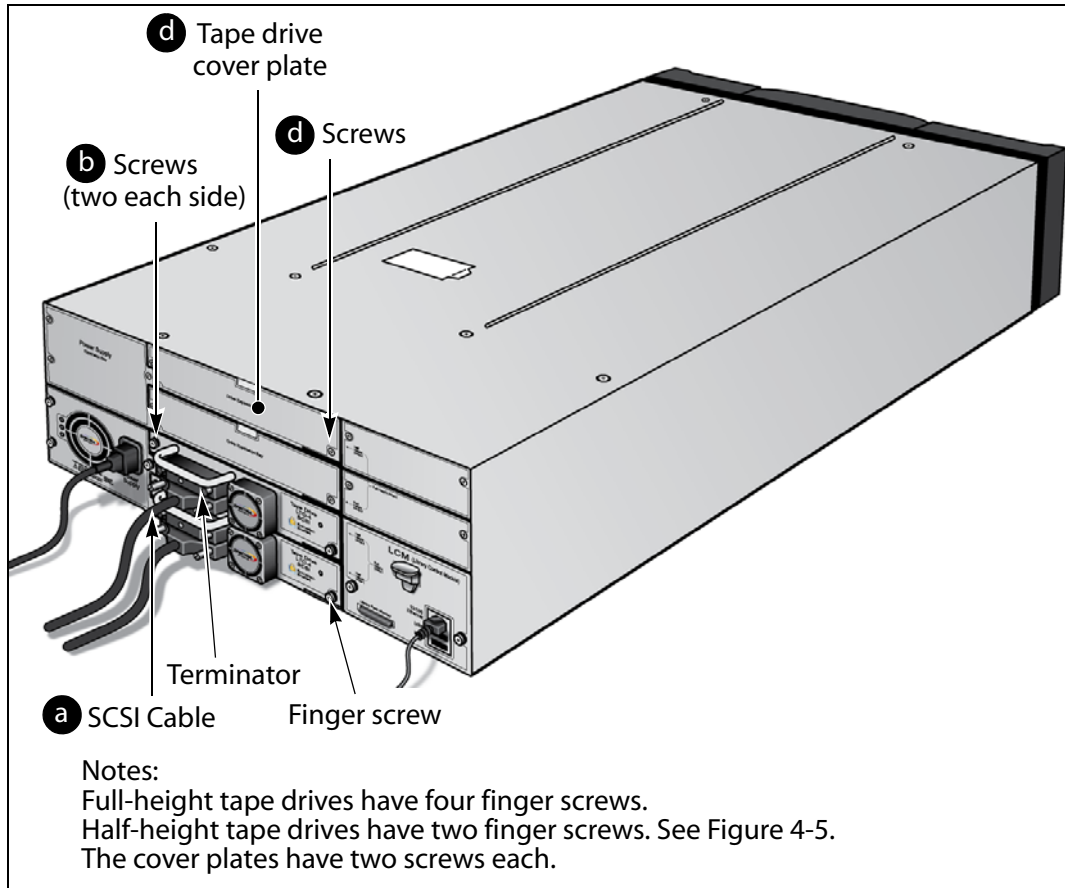
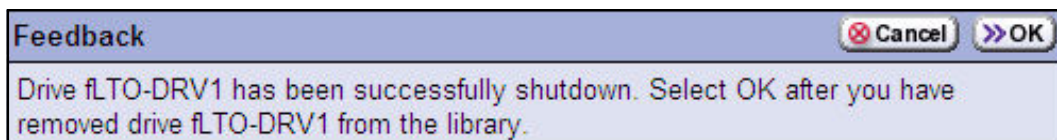


Figure 4-6 Rear panel – Remove tape drive

- c. Press **OK** to continue or **Cancel** to cancel the action.



- d. Install the tape drive cover plate using a #2 Phillips screwdriver and the screws that you removed earlier (Figure 4-6, step f).

Note: Each drive bay must be covered for safety and temperature control.
Do not leave any tape drive bays uncovered.

5. Package the tape drive in its original packaging, including the antistatic bag.

Restarting Backups

When you remove a tape drive from the library, you must reconfigure your backup software to remove that tape drive's configuration or disable the tape drive in the backup software before continuing you backup operations.

Returning Components

Package the malfunctioning tape drive and ship it to Spectra Logic as described in *Returning Components* on page 77.

Cleaning a Tape Drive Manually


Under normal operating conditions, the tape drives in the library do not require regular cleaning. The tape drives contain an automatic cleaning mechanism that allows them to clean themselves as necessary. However, a tape drive may occasionally require additional cleaning with a cleaning cartridge.

If you are experiencing read/write errors with one of the tape drives in the library and you suspect that it may require cleaning, check your backup software to see if cleaning is required.

Determining Whether Cleaning is Required

Spectra Logic recommends using your backup software to perform all tape drive cleaning operations. Refer to your backup software user manual or vendor for instructions on how to set up scheduled automatic cleanings. Refer as needed to *Cleaning a Tape Drive Manually* on page 58 to import the cleaning cartridge into the library.


You may choose to leave the cleaning cartridge in the library, particularly if you can configure your backup software to perform regular automated cleanings.

Caution:  Make sure that the cleaning cartridge has a bar code label. Your software must be able to identify the cleaning cartridge and use it only for cleaning tape drives. Any attempts to use a cleaning cartridge for data storage causes software failures.

If your software package does not have features that allow for scheduled tape drive cleanings, clean the tape drive manually as described in the following section.

Gathering Tools and Supplies

You must have a certified cleaning cartridge for the type of tape drive(s) to be cleaned. LTO cleaning cartridges are good for 50 cleaning operations. Cleaning cartridges can be purchased from Spectra Logic. If the cartridge has a bar code label, be sure to note the code, including any leading zeros. This information will help you locate the cleaning cartridge after it is loaded into the library.

Caution:  Use only certified cleaning cartridges to clean your tape drives.

Carefully follow all instructions and recommendations provided with the cleaning cartridge. Do not rewind and reuse the material in a cleaning cartridge. Reusing the material may redistribute contaminants previously removed from the tape path. If all of the cleaning material has been used, discard the cartridge and use a new cleaning cartridge.

Continuing Backups

A tape drive is unavailable for backups while it is being cleaned. It is safe to continue backups on the library's other tape drives while cleaning a tape drive. However, if you are running many backups with frequent loads and unloads, Spectra Logic recommends waiting until backups are completed before cleaning a tape drive to avoid delays in move requests coming from software.

Cleaning a Tape Drive Manually

Before you can begin the cleaning process, a cleaning cartridge must be available in the partition containing the tape drive to be cleaned. If you do not permanently store a cleaning cartridge in the storage pool for each partition, you must import one when tape drive cleaning is required. You need a magazine containing a cleaning cartridge and a magazine with one or more empty slots in the partition with the tape drive that needs cleaning.

Follow these steps to clean the tape drive.

1. If you keep a cleaning cartridge stored in the partition, use its bar code label information to determine its location.
2. If necessary, import the cleaning cartridge into the partition containing the tape drive that needs cleaning.

When the access port door opens, insert the cleaning cartridge, making sure that it is correctly oriented (see Figure 4-7).

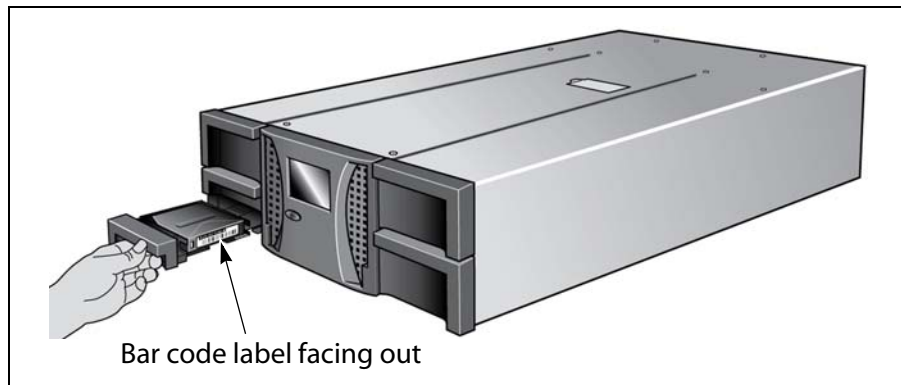


Figure 4-7 Load the cleaning cartridge.

3. Move the cleaning cartridge from the Access port to the tape drive needing cleaning.

The tape drive automatically performs the cleaning, which takes approximately one minute, and ejects the cartridge when finished.

4. Move the cleaning cartridge from the tape drive back to the slot from which it came.

If the cleaning cartridge was expired before the cleaning started, the tape drive automatically ejects the cartridge and does not perform the cleaning. If a tape drive still needs cleaning, perform the following steps:

- a. Export the expired cleaning cartridge.
- b. Import a new cleaning cartridge.
- c. Repeat the previous steps to clean the tape drive.
5. If you have additional tape drives to clean, repeat the steps for each tape drive.
6. If you do not store the cleaning cartridge in the library, export it after the cleaning.
7. Make sure you track the number of times the cleaning cartridge has been used.

Tracking Cleaning Cartridge Use

Cleaning cartridges have a limited number of uses, but are good for 50 cleaning operations. Spectra Logic recommends marking the cleaning cartridge label after each use so that you know when it has reached the end of its life cycle.

Purchasing Cleaning Cartridges

To purchase cleaning cartridges, contact your sales representative or visit the Spectra Logic web site at www.spectralogic.com/shop.

Notes

5 Replacing the Transporter

Before You Begin

Ensure that the work area is free from conditions that could cause **electrostatic discharge (ESD)**—discharge static electricity from your body by touching a known grounded surface, such as a computer's metal chassis.

Note: Depending on the ASM service level you purchased, the transporter may not be included in your on-site ASM kit.

The transporter, shown in Figure 5-1, moves the media within the library.

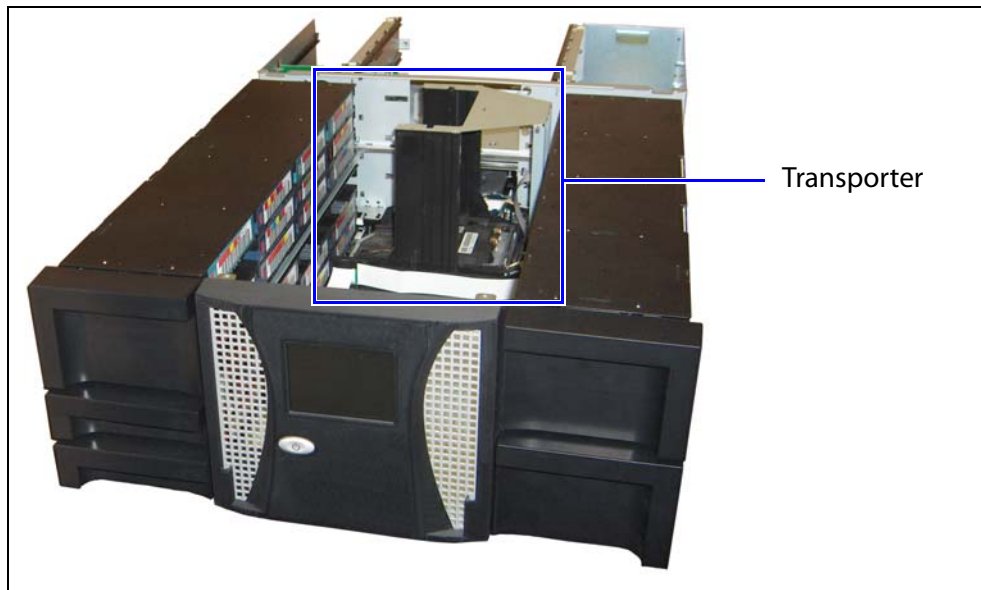


Figure 5-1 Location of the transporter (cover off for clarity only).

Gathering Tools and Supplies

You need the following tools and materials to complete this procedure:

- #1 Phillips screwdriver
- Paper clip or similar object

- New Spectra T50e transporter

Note: After removing the new transporter from its packaging, keep the packaging to return the old transporter to Spectra Logic.

Continuing Backups

Backups are interrupted if the transporter is malfunctioning, because media cannot be moved to or from drives. Also, backups cannot run during the replacement of the transporter, since the library must be powered down.

Use your backup software to stop any backups running to the library. Restart any backup processes after you complete the replacement procedure and run diagnostics to ensure that the new transporter is operational.

Powering off the Library

1. Press and hold the front panel power button for approximately one second. The power-off sequence takes approximately two minutes while the library allows applications to shut down gracefully.

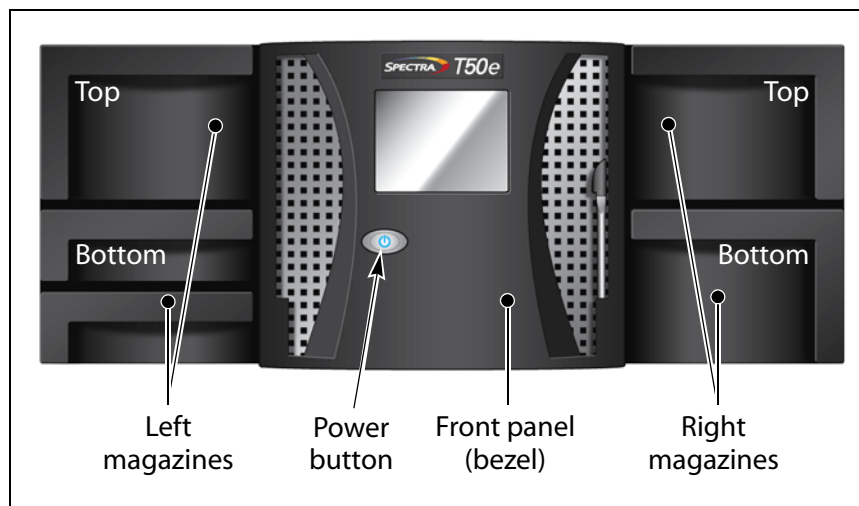


Figure 5-2 Front panel components.

2. Remove the power cord(s) and set them aside.

Removing the Magazines

Ensure that you can simultaneously reach both the front and back of the library, or engage a second person to help you with this procedure.

1. Insert a straightened paper clip (or similar object) into the small holes at the back of the library while simultaneously pulling forward on the magazines.

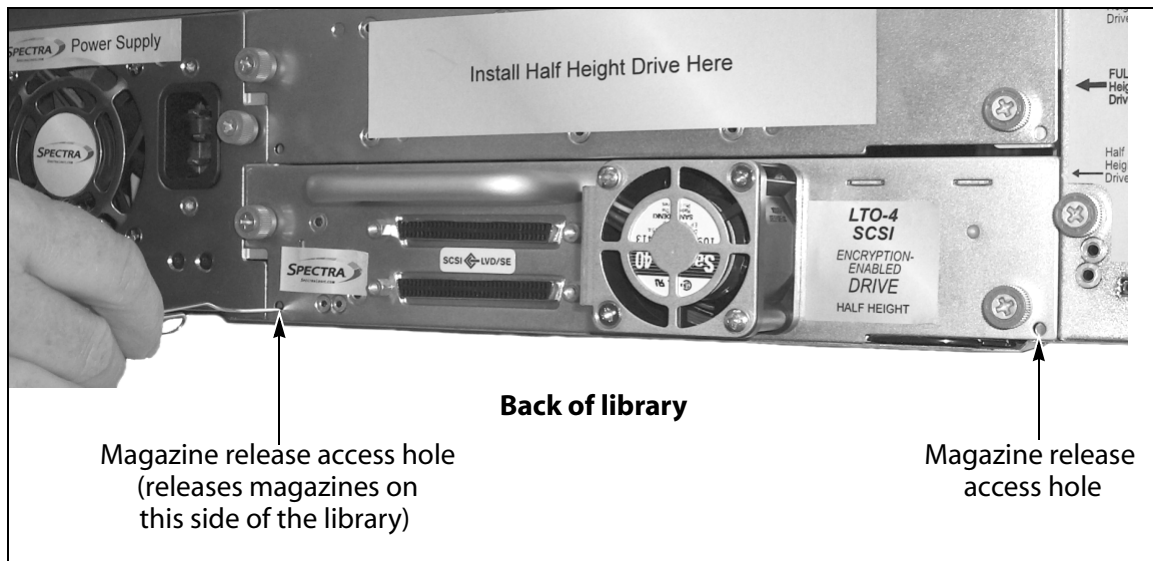


Figure 5-3 Magazine release.

Note: Do not use this option to remove the magazines for any reason other than replacing the transporter.

2. Set the magazines aside, making a note of the location of each.

Note: Place the magazines in the order that you removed them, as shown here



Left-side magazine

Right-side magazine

Important! It is important to replace the magazines in the same locations, as the library will not function properly otherwise.

Accessing the Transporter

Warning: ⚠ Risk of electrical shock. Hazardous moving parts. Turn off the power to the library and disconnect the power cords before accessing the transporter.

Warnung: ⚠ Gefahr eines elektrischen Schlages. Gefährliche bewegliche Teile. Schalten Sie das Gerät aus, um die Library und trennen Sie das Netzkabel vor dem Zugriff auf die Transporter.

The transporter is removed from the front of the library and you do not need to remove it from a rack to perform this procedure.

Removing the Transporter

Follow these steps to remove the transporter from the library.

1. Set the stylus aside.

2. Remove the screws securing the front panel (panel).

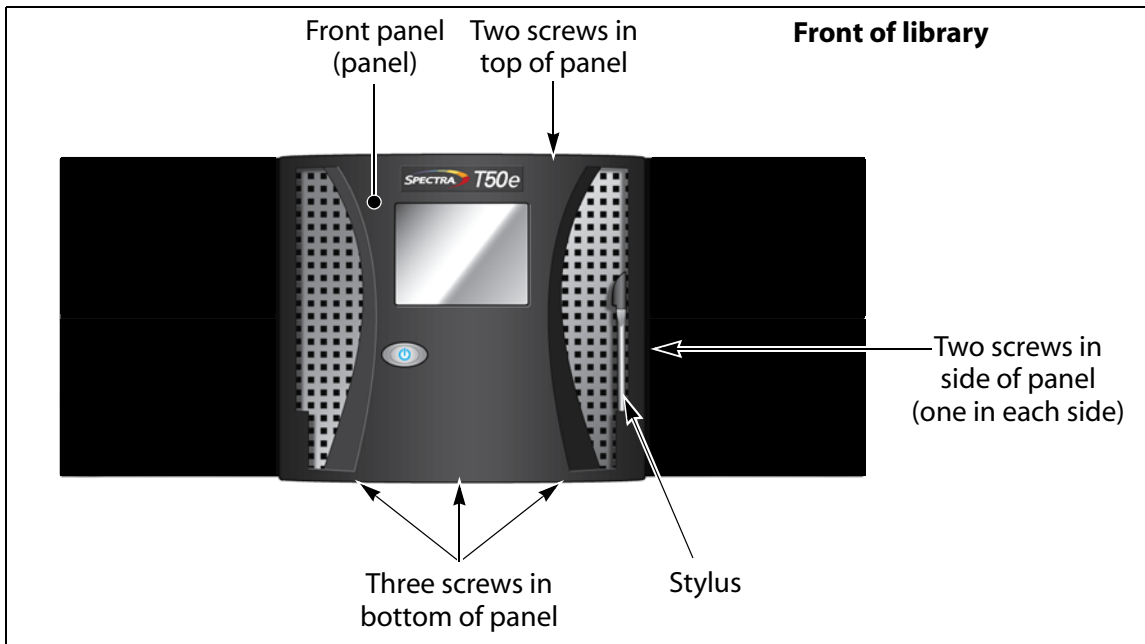


Figure 5-4 Remove the screws securing the front panel.

- a. Using a #1 Phillips screwdriver, remove the:
 - two black Panhead screws securing the top of the panel
 - three flathead screws securing the bottom of the panel
 - two panhead screws securing the sides of the panel
- b. Set the screws in a safe location.

3. Gently rotate the panel forward to access the interior cables.

Caution: ⚠ Use care pulling the front panel forward, as you can damage the library if you pull too firmly on the cables.

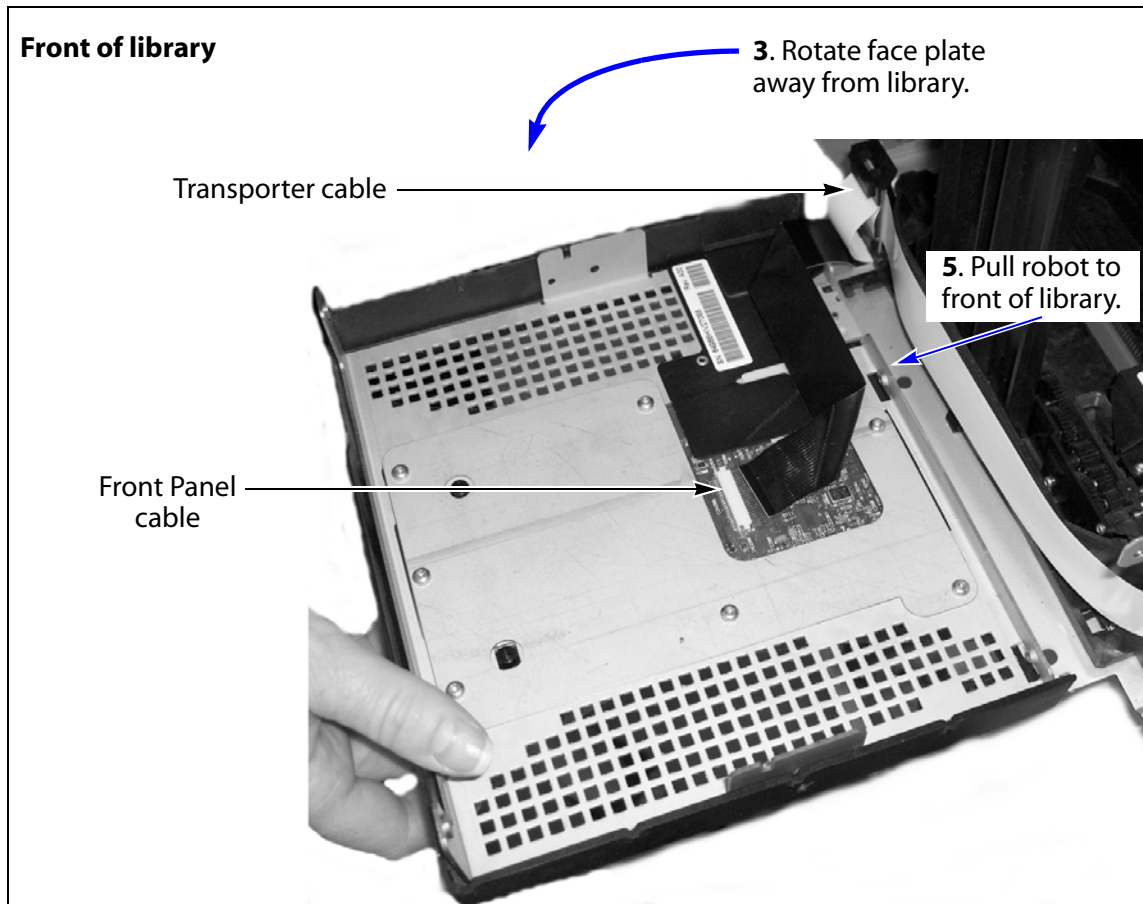


Figure 5-5 Access the interior cables.

4. Disconnect the front panel cable following these steps.

- a. Gently pull backward on the cable retention (small brown component on each side of cable) to release the cable.

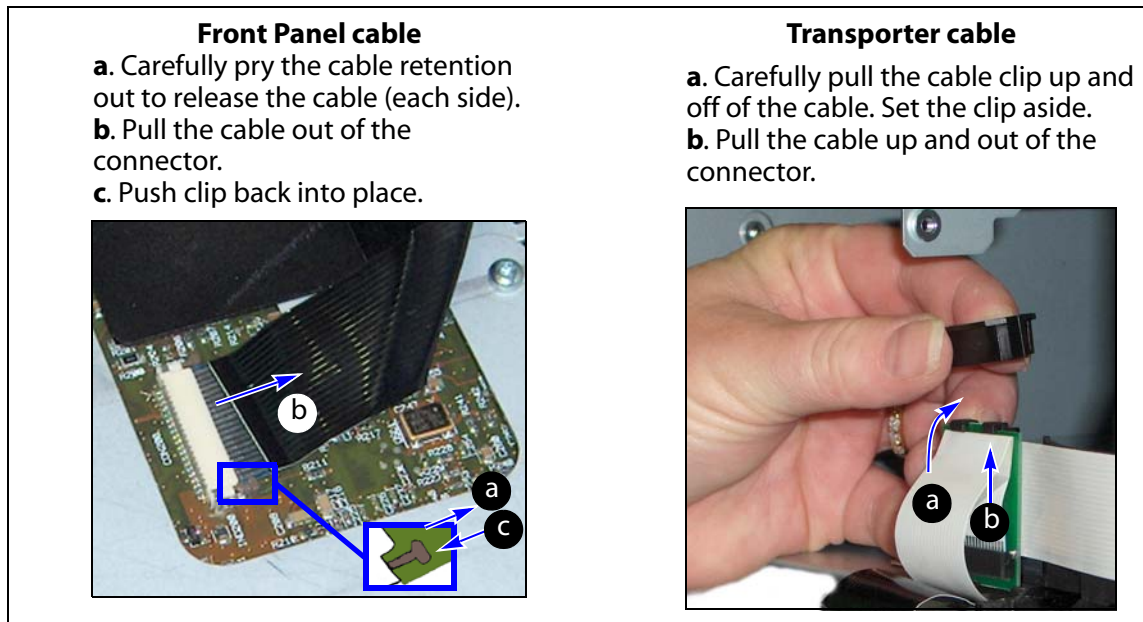


Figure 5-6 Disconnect the interior cables.

- b. Gently pull the cable out of the connector.
 - c. Push the cable retention back into place.
 - d. Set the front panel aside.
5. Carefully pull the robot to the front of the library to disconnect the transporter cable.
 - a. Remove the cable clip and set it aside. Rotate the clip backward for easy removal.
 - b. Gently pull upward on cable 2 to disconnect it from the connector.
6. Push the cables down to move them out of the way and gently pull the robot out of the library.
 - You may need to gently push upward on the library cover.

- You may need to rotate the robot so that the metal shield is facing the front of the library.

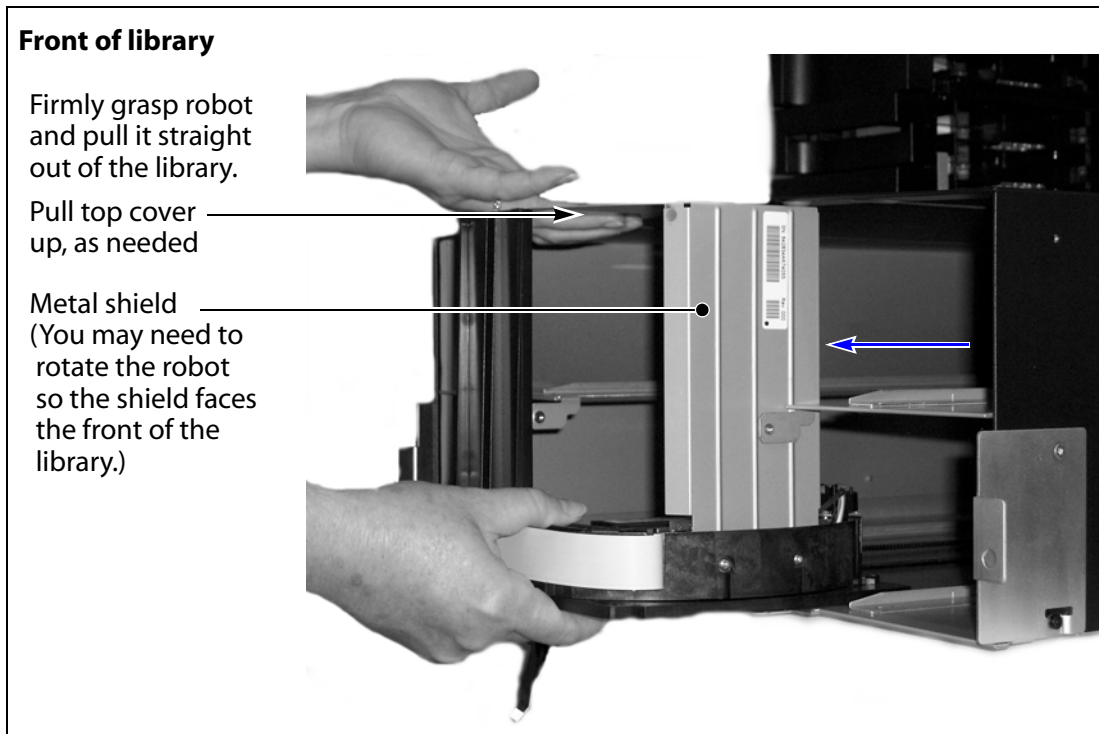


Figure 5-7 Pull the robot out of the library.

7. Package and ship the transporter to Spectra Logic as described in *Returning Components* on page 77.

Installing the Transporter

Follow these steps to install the new transporter.

1. Carefully unpack the new transporter.
2. Set the transporter on its ESD packaging until you are ready to install it in the library.

Install the Transporter

Follow these steps to align the transporter in the library.

1. While holding the cables down, align the slots in the transporter with the internal gear and rail.

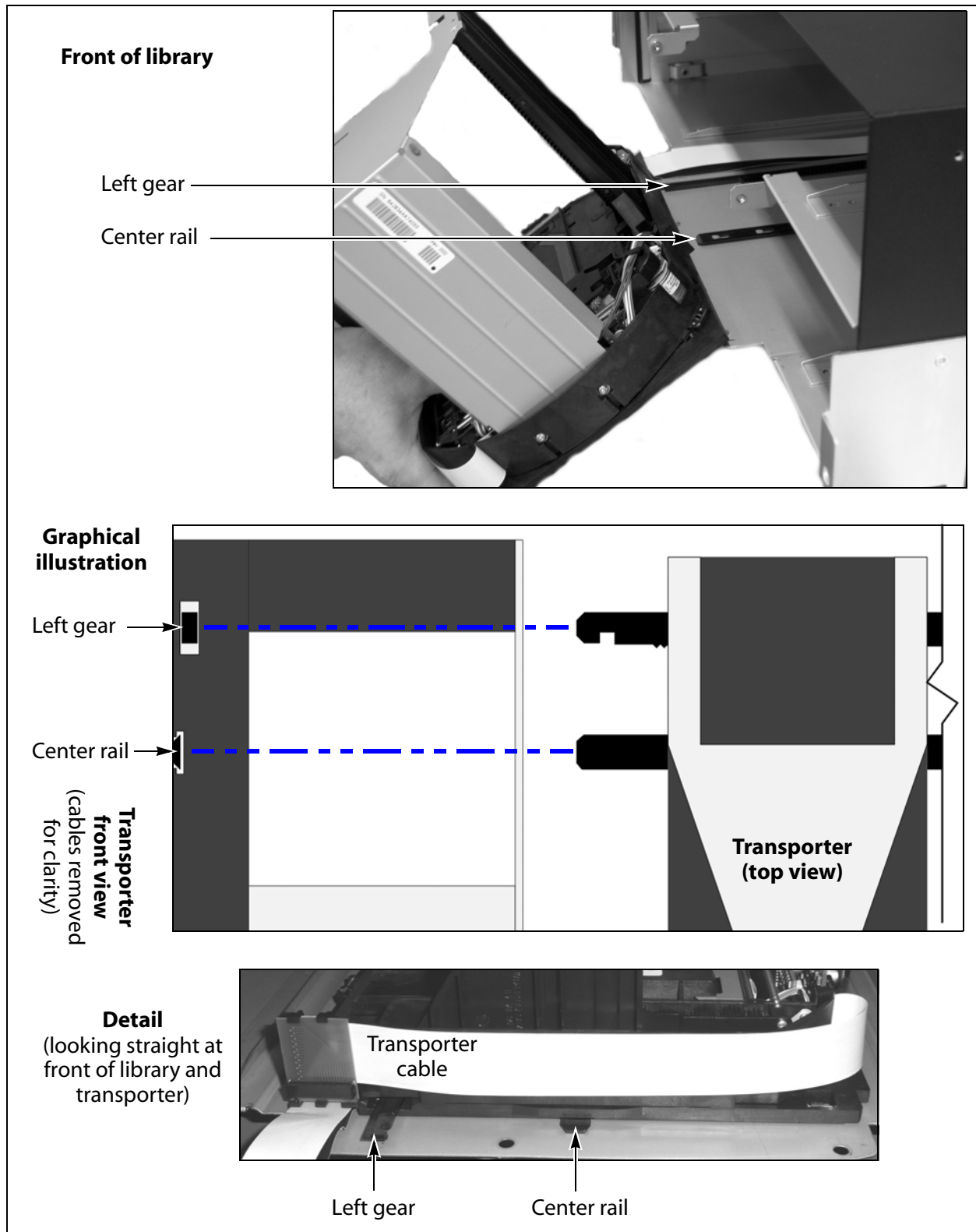


Figure 5-8 Align the library gear and rail with the slots in the transporter.

2. Ensure that the left gear and center rail engage the internal gears.

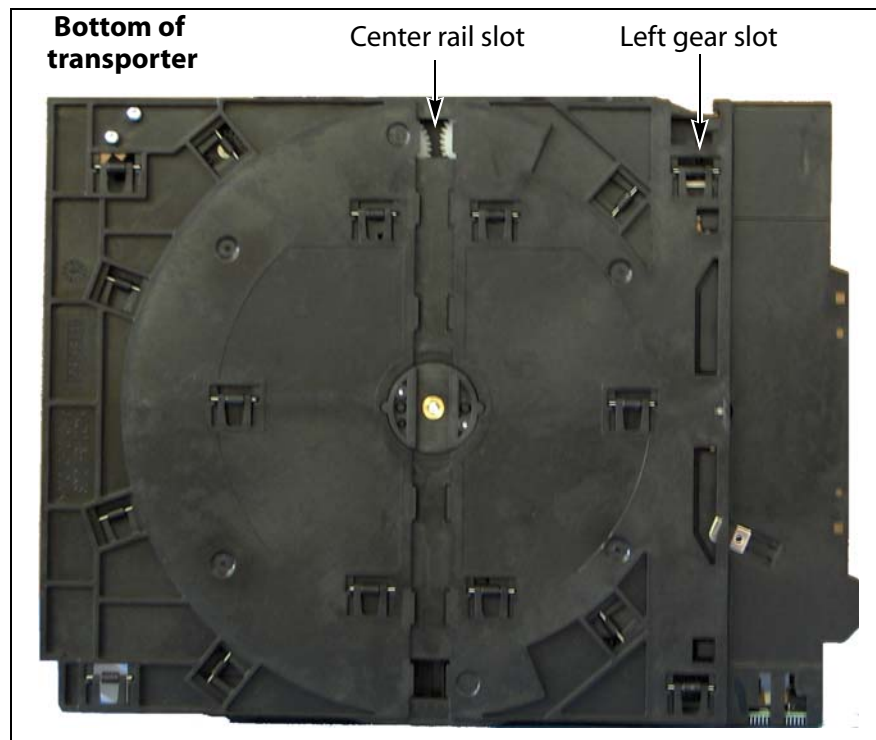


Figure 5-9 Bottom of transporter showing slots.

3. Once the gears are inserted into the two slots, gently slide the transporter into the library while pushing upward on the top cover. As you push the transporter into the library slowly rotate it clockwise while holding the left gear down to prevent it from buckling.

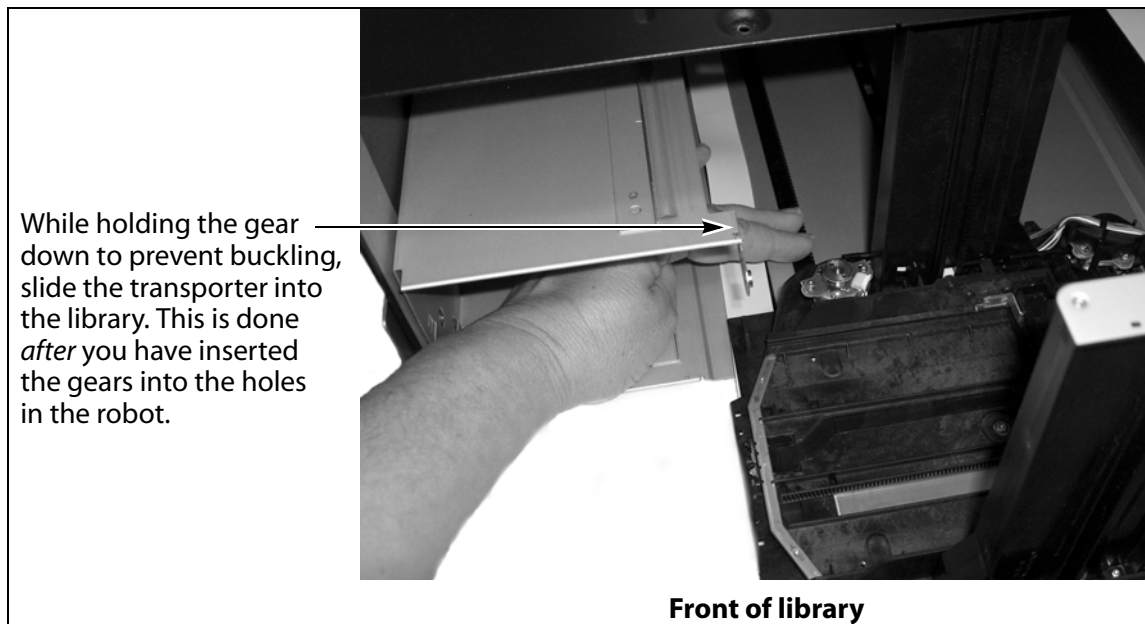


Figure 5-10 Hold the gear down to prevent buckling.

4. Ensure that the internal gear and center rail shown in Figure 5-8 are in place. In other words, ensure that they protrude out of the front of the library through the proper openings. Also ensure that the two cables are protruding out of the front of the library.

Connect the Cables

1. Reconnect the transporter cable that you removed earlier.
 - a. Gently push the cable into the connector.
 - b. Reinstall the cable clip that you removed earlier. Make sure that the cable clip snaps fully into place.
2. Push the transporter further back into the library.

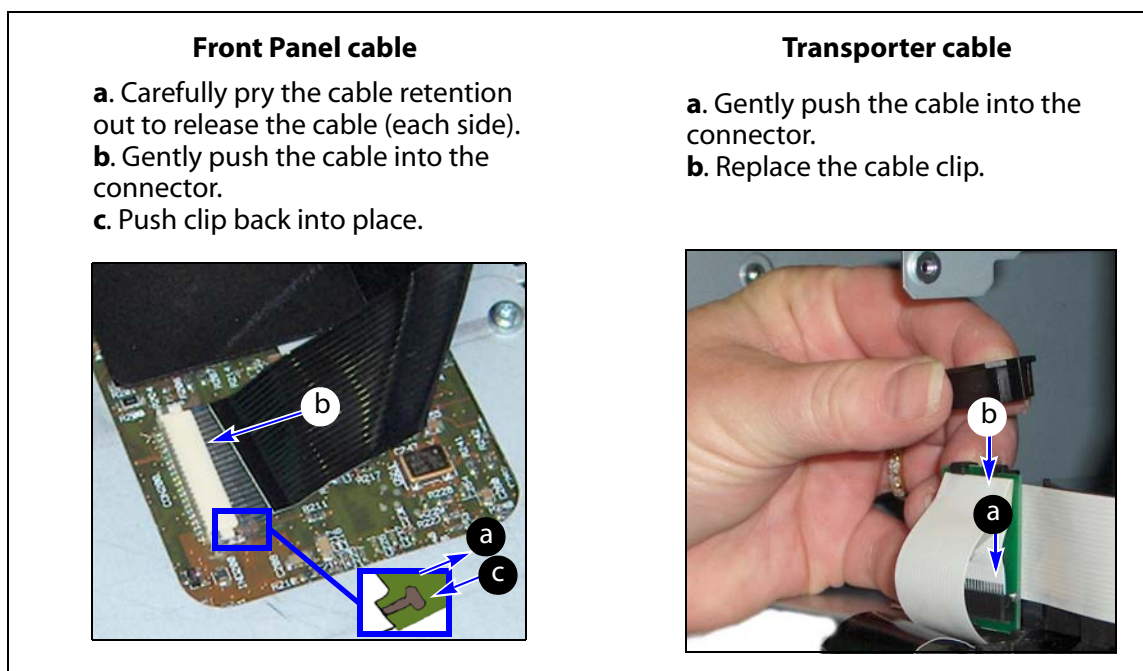


Figure 5-11 Disconnect the interior cables.

3. Reconnect the front panel cable that you removed earlier (cable 1).
 - a. Gently pull backward on the cable retention (small brown component on each side of the cable).
 - b. Connect cable 1.
 - c. Push the cable retention back into place.

- d. Route cable 1 under the two retention tabs in the front panel.

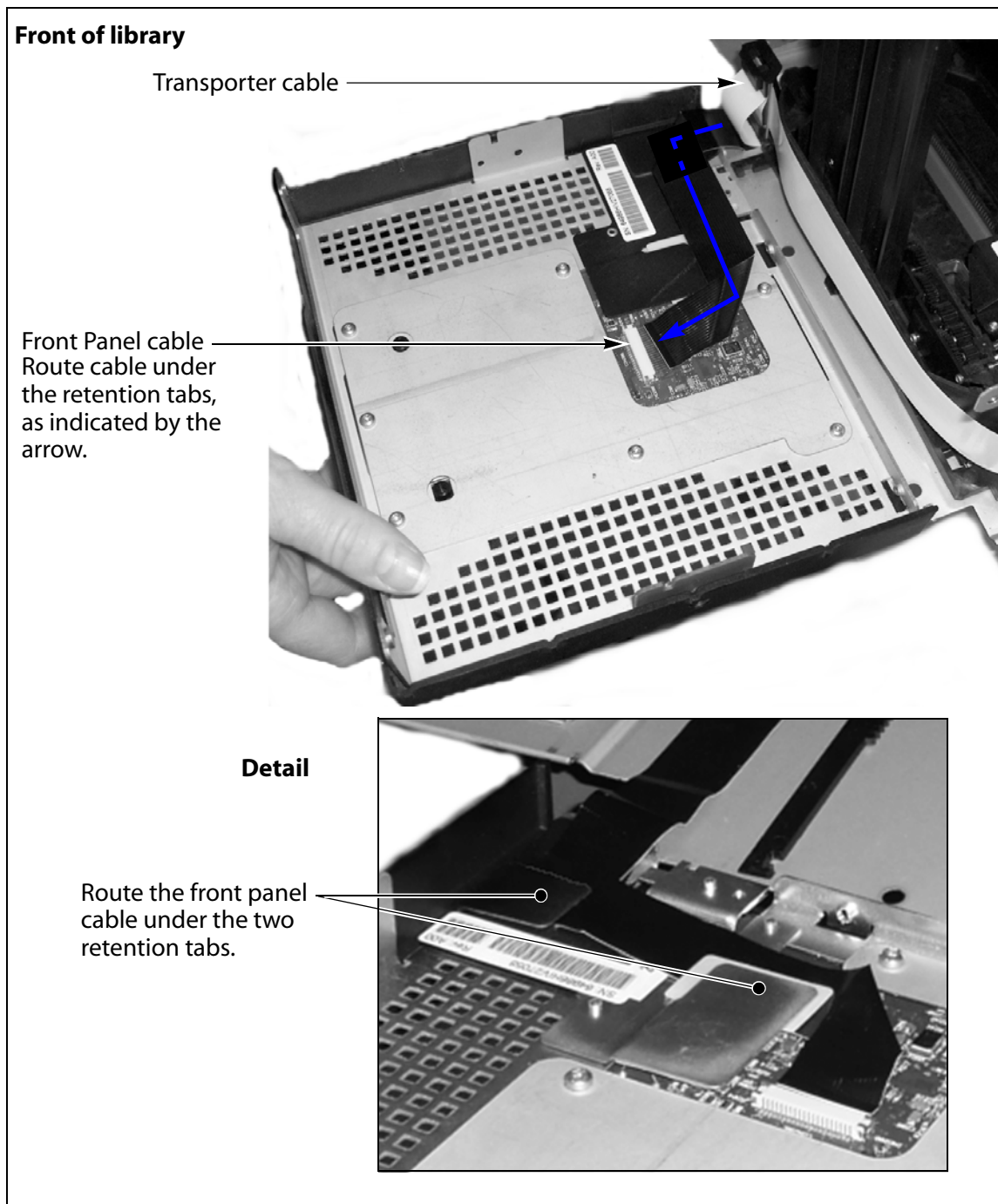



Figure 5-12 Route the front panel cable.

Install the Front Panel

Follow these steps to reinstall the front panel.

1. Rotate the front panel up to secure the gear to the front panel.

Caution:  Ensure that you do not “pinch” the flex cables when you rotate the front panel back into place.

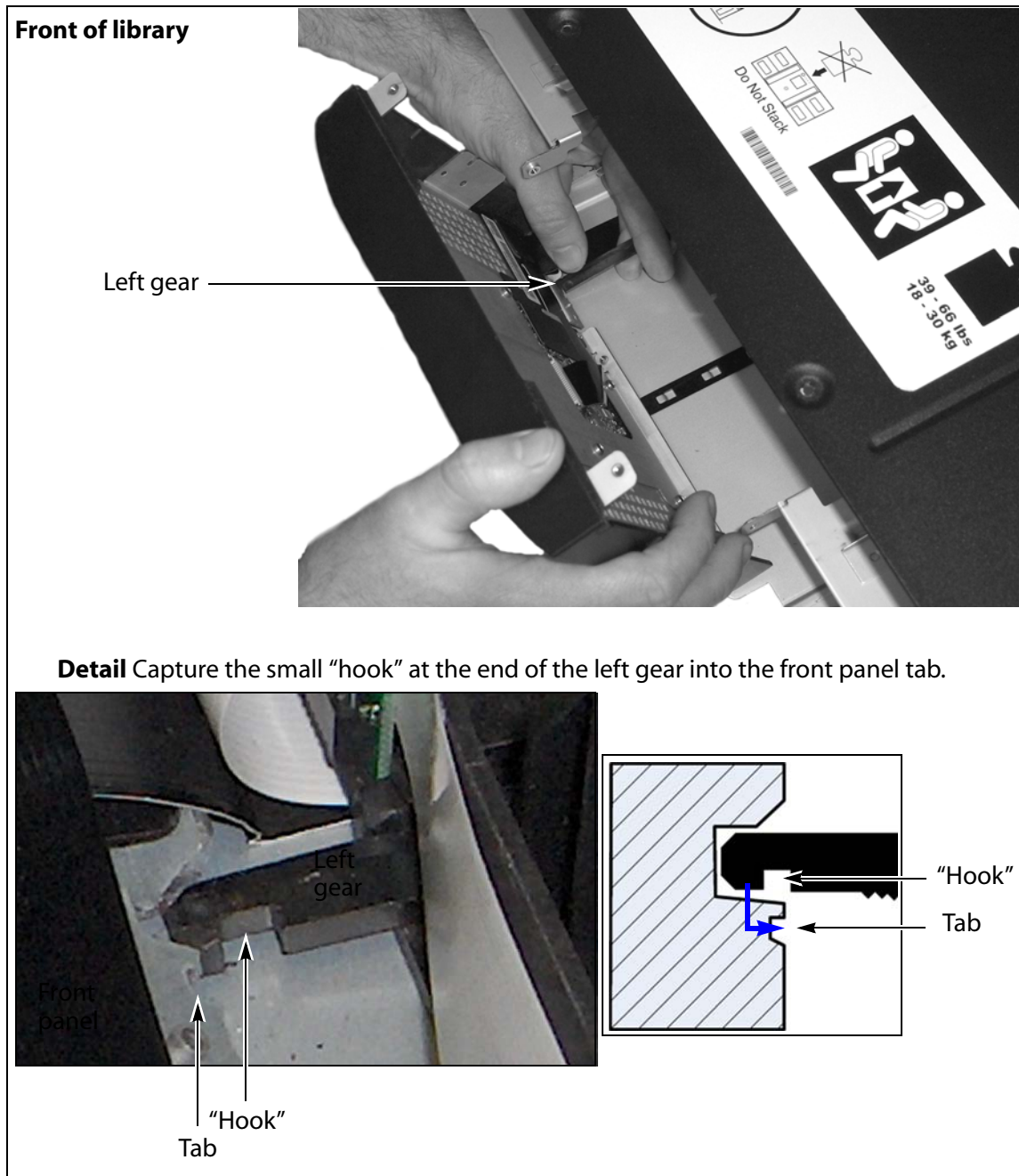


Figure 5-13 Secure the gear to the front panel.

- a. Hold the front panel so that it is tilted close to the library.
- b. Reach in and secure the left gear to the front panel, as shown in Figure 5-13.

- c. Carefully rotate the front panel the remaining distance into the library.

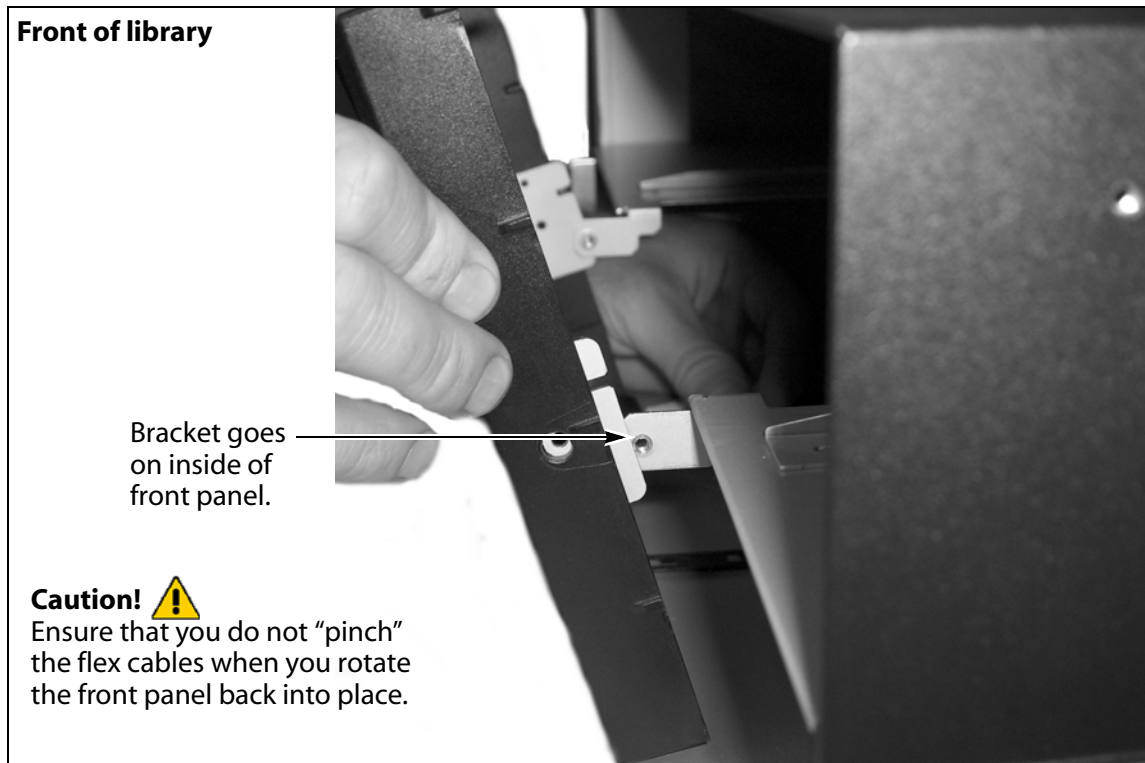


Figure 5-14 Replace the front panel.

- d. Replace the seven screws that secure the front panel that you removed earlier.

Completing the Replacement

1. Reinsert the magazines making sure to put them back in their original locations to prevent move fails.
2. Reconnect the power cord.
3. Power on the library—push the front panel power button for two to three seconds. Wait for the library to initialize, which takes from six to nine minutes.
4. Manually test the transporter functions either from the front panel LC or from the RLC. After each move, return the media to its original location.
 - Slot to slot moves
 - Slot to drive moves
 - Slot to Access port moves

The transporter replacement is complete. Package the old transporter and return it to Spectra Logic in the packaging from the new transporter. See *Returning Components* on page 77 for instructions.

If you have any questions, contact SpectraGuard Technical Support at www.spectralogic.com/support.

Notes

6 Returning Components

After you replace a component, package it and ship it to Spectra Logic as described in this chapter. If you are not asked to return the component, dispose of it in the same manner as other electrical components, such as computer monitors and keyboards.

Packaging a Component for Shipment

Note: Use the packaging from the replacement component to pack the component you are returning. The packaging for the component may look different from the packaging shown in this chapter.

1. Place the component inside the anti-static bag.
2. Fold the bag snugly around the component and tape it closed (Figure 6-1).

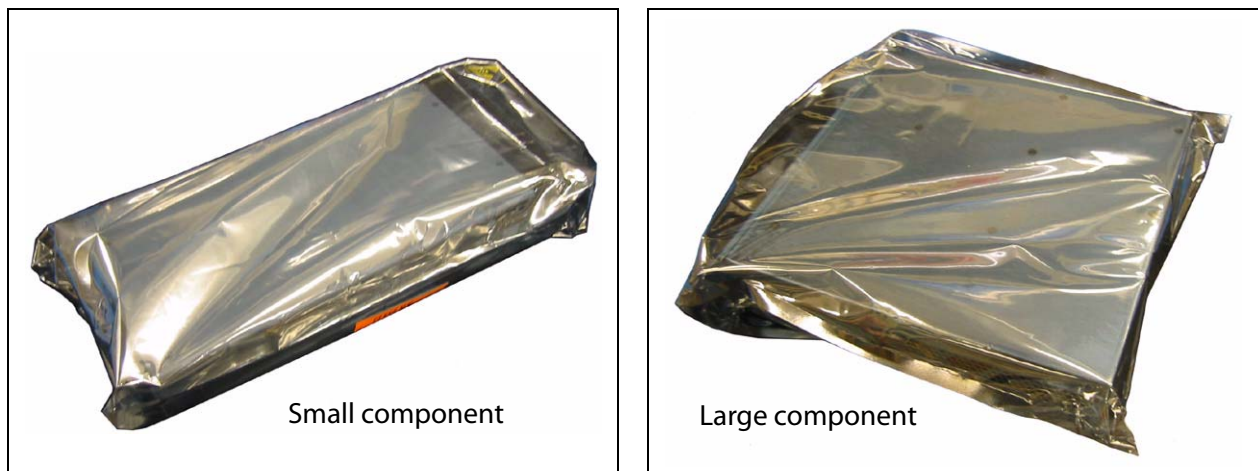


Figure 6-1 Wrap the component in an anti-static bag.

3. Place the bottom air cushion, plastic side up, in the shipping box.

4. Place the wrapped component in the center of the bottom air cushion (Figure 6-2).

Note: The air cushions for small components are slightly different in appearance, but function the same way.

5. Place the top air cushion, plastic side down, over the component (Figure 6-3).
When properly installed, the two air cushions suspend the component securely in the center of the box.



Figure 6-2 Place the component on the bottom air cushion.



Figure 6-3 Place the top air cushion over the component.

6. Tape the box securely closed.
7. Proceed to *Shipping RMA Returns* for shipping instructions.

Shipping RMA Returns

Caution: You must package the component in the box provided by Spectra Logic, making sure to use all of the packing materials provided to prevent damage during shipment. Failure to properly package the component may result in damage to the component. If a component is damaged in shipping due to improper packing, the warranty on the component is void.

1. Before you ship a component back to Spectra Logic, obtain a Return Materials Authorization (RMA) number from a SpectraGuard Technical Support representative (see *Contacting Spectra Logic* on page 4). Spectra Logic needs this number to identify the part on its arrival.
2. Write the RMA number on the shipping label. If you fail to include the RMA number on the label, the package will be returned to you. If you do not know your RMA number, contact Spectra Logic Technical Support.
3. Follow the steps in the table below that are appropriate for your location.

Instructions for Domestic Returns	Notes
Ship the package to: Spectra Logic Corporation ATTN: {RMA Number} Suite B 5571 Arapahoe Avenue Boulder CO 80303	<ul style="list-style-type: none"> • Make sure you write the RMA number on the shipping label. • For follow-up on RMA equipment service and returns, contact SpectraGuard Technical Support either by phone or email (see www.spectraglogic.com/support).
Instructions for International Returns	Notes
<ol style="list-style-type: none"> 1. Fill out your portion of the International Shipping Instructions form, available on the Spectra Logic Web site. 2. Return the form to Spectra Logic in one of the following ways: Email: intlreturns@spectralogic.com Fax: 303.939.8844 Post: Spectra Logic International Returns 1700 N 55th Street Boulder CO 80301 USA 	<ul style="list-style-type: none"> • Spectra Logic arranges for return shipment when a request is made to International Shipping. • When you receive confirmation from Spectra Logic, follow the instructions given to prepare the component for pickup by the shipper.

Notes

Index

A

accessing
 LCM 30 to 32
 transporter 64
ASM service, description 9

B

backups, continuing while
 cleaning tape drives 58
 replacing LCM 20
 replacing power supply module 39
 replacing transporter 62
button, library power 16

C

cautions
 adding or removing devices from host 45
 cleaning cartridge label 57
 cleaning cartridge use 58
 correct insertion of LCM compact flash card 33
 do not rewind cleaning cartridges 58
 flex cables 73
 front panel cables 66
 label cleaning cartridges 57
 LCM malfunction 20
 packaging components for shipping 79
 tape drive compatibility 44
 use approve cleaning cartridges 58
 using flash card 31

cleaning cartridges
 bar code label caution 57
 do not rewind 58
 importing 58
 label when stored in library 57
 purchasing additional 59
 requirements 58
 tracking use 59
cleaning tape drives 57 to 59
components
 interior CRU 13
 packaging for return 77 to 78
 rear panel CRUs 14
 transporter 61
configuration, restoring saved 35
connectors
 LCM 19
 USB port 19
contacting Spectra Logic
 main offices 4
 technical support 4
conventions used in this guide 11
CRUs
 interior 13
 rear panel 14

D

drives
 See tape drives

E

electrical shock
 warning 64
ESD, protecting against 15

Ethernet connector location 19

F

fax numbers
 Spectra Logic offices 4
flash (SD) card
 location 19
 replacing 32 to 34
 returns 33
 use caution 31
flex cable caution 73
front panel cable caution 66

H

host
 adding or removing devices caution 45

I

importing a cleaning cartridge 58
improper packaging, affect on warranty 79
initialization, library power-on 16
installing
 flash (SD) card 32 to 34
 LCM 30 to 32
 power supply module 40
 tape drives 43 to 53
 transporter 61 to 75
interior CRUs 13

K

Knowledge Base

- accessing 4
- for technical support 4
- web sites address 4

L

LCM

- continuing backups while replacing 20
- malfunction caution 20
- preparing for replacement 20
- replacing 30 to 32
- restoring a saved library configuration 35
- USB port location 19

library

- interior CRUs 13
- power-off sequence 16
- power-on sequence 16
- restoring a saved configuration 35
- returning components 79
- software license 2

license, library software 2

location

- LCM connectors 19
- power supply 40
- transporter 13

M

- mailing address, Spectra Logic 4
- maintenance
 - tape drive cleaning 57 to 59

P

packaging components for return 77 to 78

packaging, improper 79

phone numbers

- Spectra Logic offices 4
- Spectra Logic technical support 4

policies, RMA returns 79

power

- turn off library 16
- turn on library 16

power cord

- warnings 4

power supply module

- continuing backups while replacing 39
- location 40
- replacing 40
- required tools and materials 39

R

rear panel CRUs

- locations 14

repair, RMA policy 79

replacing

- flash (SD) card 32 to 34
- LCM 30 to 32
- power supply module 40
- tape drives 43 to 53
- transporter 61 to 75

resetting the library 17

returns

- flash (SD) card 33
- packaging requirements 77
- RMA requirements 79

RMA number

- obtain before shipping 79
- on shipping label 79

S

self-maintenance

- tape drive cleaning 57 to 59

software

- license for library 2

Spectra Logic

- main offices 4
- manuals, obtaining 9
- technical support 4
- web site, main 4
- web site, support 4

T

tape drives

- cleaning 57 to 59
- compatibility caution 44
- replacing 43 to 53
- required materials for cleaning 58
- testing 53

technical support

- RMA number 79
- telephone access for ASM 9
- using Knowledge Base 4
- web site 4

tools

- LCM replacement 19
- power supply module replacement 39
- tape drive replacement 44
- transporter replacement 61

transporter

- continuing backups while replacing 62
- location 13, 61
- replacing 61 to 75
- required tools and materials 61

typographic conventions 11

U

USB port, location [19](#)

W

warnings

electrical shock [64](#)

power cord use [4](#)

warranty, improper

packaging [79](#)

web sites

Knowledge Base [4](#)

LTO tape drive manuals [11](#)

purchasing cleaning

cartridges [59](#)

RMA returns [79](#)

Spectra Logic home [4](#)

Spectra Logic manuals [9](#)

technical support [4](#)

Notes